other than Standard operating conditions are encountered, such as excessive waterhammer, operating in throttled position or under high operating pressure, gate valves of a design approved by the Engineer shall be used.

Gate valves four (4) inches and smaller shall be rated at 200 p.s.i. working pressure for non-shock, cold water service. all working parts of this class valve shall be bronze or bronze mounted and shall be standardized and interchangeable.

Gate valve ends shall be of any of the types commonly used in the water works industry, including screwed ends, hub ends, mechanical joint ends, flanged ends, spigot ends, universal ends and ends for direct connection to asbestos-cement pipe with rubber rings. Any ends other than those commonly used in the water works industry must have the approval of the Engineer prior to use.

(2) Plug Valves - The term "plug valve" shall, in these Standards, refer to regular duty plug valves, corporation stops and curb stops.

Regular Duty Plug Valves shall be designed for regular duty service and in sizes below twelve (12) inches, shall have a pressure rating not less than 175 p.s.i. water, oil or gas working pressure. Valves larger than 12 inches shall have a pressure rating approved by the Engineer.

Corporation stops shall have all bronze bodies, keys, stems, stem washers and stem nuts. Corporation stops shall have the proper type threads for the type of pipe or pipe clamp to which attached.

(3) Check Valves - Check valves for regular duty water works service shall employ non-corrosive materials in the construction of hinge pins, hinges, gate faces and seat faces.

Check valves up to twelve (12) inches in size for regular duty shall have a pressure rating of not less than 200 p.s.i. non-shock, cold water, oil or gas rating. Larger valves and valves for use in other than regular duty shall be of a pressure rating approved by the Engineer.

End connections on check valves may be any ends commonly used in water works practice, including hub ends, flange ends and universal ends. Types of ends other than those commonly used in the water works industry shall have the approval of the Engineer prior to use.

(4) Air and Vacuum Release Valves - Air and vacuum and air release valves shall have internal working parts made of corrosion resistant materials.

Air and vacuum and air release valves for regular service shall have a pressure rating of not less than 150 p.s.i., water, oil and gas, non-shock. Where other than regular service operation is required the valves shall have a pressure rating approved by the Engineer prior to their use.

(5) Miscellaneous Valves - Any type of valve not specifically covered in these specifications shall be considered in this category of "Miscellaneous Types of Valves".

Such valve types include: pressure relief valves, pressure regulating valves, altitude valves and globe valves, among other valve types.

Valves in this classification shall have the approval of the Engineer prior to use.

f. Fire Hydrants - When the required fire flow is 500 gpm, wet barrel or dry barrel fire hydrants may be installed. Wet barrel fire hydrants shall be installed when the required fire flow is 1500 gpm or greater.

Each fire hydrant shall have a minimum of one - $2\frac{1}{2}$" outlet and one - $4\frac{1}{2}$" outlet, except when the required fire flow in the system is 1500 gpm or greater then each hydrant shall have two - $2\frac{1}{2}$" outlets and one - $4\frac{1}{2}$" outlet. Outlets shall have National Standard Hose Threads.

Wet barrel fire hydrants shall meet the requirements of A.W.W.A. Standard C503. Dry barrel fire hydrants shall meet the requirements of A.W.W.A. Standard C502.

Each fire hydrant assembly shall be served with a minimum 6" diameter run of pipe, and shall be provided with a gate valve. Provisions shall be incorporated in the construction of

dry barrel hydrants to automatically shut off the flow of water in the event the hydrant is broken off.

Installation of fire hydrants shall be in accordance with Plate WS-9 in valley areas.

In mountainous areas only, the hydrant inlet may be reduced to 4 inches and installed in accordance with Plate WS-10.

g. Valve and Meter Boxes - Valve and meter boxes shall be constructed of materials capable of withstanding the loads imposed upon them.

Adequate access to all boxes shall be provided by means of readily removable covers.

Sizes of boxes shall be determined by sizes of valve or meter served.

Boxes shall be approved by the County Public Works Director prior to use.

2. Installation

a. General - All piping shall be supported and braced against movement as shown on the plans or as specified herein. When temporary supports are used they shall be sufficiently rigid to prevent any shifting or distortion of the pipe.

Where piping is installed on curves the maximum deflection of each joint shall be within the maximum deflection recommended by the pipe manufacturers.

Sufficient flexible couplings of Engineer approved design shall be provided in all piping adjacent to structures to permit differential settling of the foundation of said piping and structures without damage to the piping, or as may be required for ease of installation or removal of the pipe.

All dirt and scale shall be removed from the pipe prior to installing.

b. Earthwork - All trenching work shall conform to the requirements of the Item Number 2 of Subsection B (Streets and Highways) as found in these Standards.

c. Depth of Cover - Minimum cover from finished grade shall be as follows:

4" - 6" Pipe	- 36"	12" Pipe	- 48"
8" Pipe	- 36"	14" Pipe	- 48"
10" Pipe	- 36"	14"+Pipe	as required by County Public Works

d. Laying and Handling Pipe - Proper implements, tools and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe, convenient, and workmanlike prosecution of the work.

All pipe, fittings and valves shall be carefully lowered into the trench in such a manner as to prevent damage to pipe or pipe coating. Under no circumstances shall pipe or accessories be dropped or dumped into the trench. Before lowering and while suspended, the pipe shall be inspected for defects and cast iron pipe shall be rung with a light hammer to detect cracks. Any defective, damaged or unsound pipe shall be rejected and sound material furnished. Cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat and skillful manner without damage to the pipe.

All pipe shall be laid and maintained in the required alignment, with fittings and valves at the required locations and with joints centered and spigots home, and with all valve stems plumb. When the pipe is bedded in a trench it shall be brought into true alignment and shall be secured there with proper backfill material, carefully tamped under and on each side of it as specified herein. Care shall be taken to prevent dirt from entering the joint space.

Each length of pipe shall have a swab drawn through it and shall be freed of any visible evidence of contamination, dirt and foreign material before it is lowered into its position in the trench, and it shall be kept clean during and after laying. At times when pipe laying is not in progress, the open ends of any pipe which has been laid shall be plugged. Trench water shall not be permitted to enter the pipe.

All installation shall be in full conformance with the manufacturer's recommendation.

e. Service Laterals - Copper service laterals shall be installed in a trench of such depth and direction that the service pipe (tubing) will be at least 24" below finished street grade, shall be laid in a plane perpendicular to the longitudinal axis of the main, shall be as far away from sewer laterals as possible and shall not interfere with other utility installations.

The copper tubing shall be bent in such a manner as to prevent kinking of the tubing.

For 3/4" and 1" services, the corporation stops shall be tapped into that side of the main to which the service is to be installed at a point approximately 60 degrees down from the top of the main with the shut-off valve of the corporation stop facing up.

Service laterals may be attached to mains by the use of saddles where recommended by the pipe manufacturer and shall conform to the manufacturer's recommendations.

The house end of the service lateral shall terminate with a curb stop corresponding to the size of the service, with the outlet in a horizontal position facing the lot to be served. If meters are required, a concrete meter box of proper size shall be levelled and longitudinally centered over the end of the service. The meter box shall be set square with the curb or property line in solid ground, with the top of the box at the elevation of the top of the curb or adjacent ground.

f. Thrust Backing and Harness - All tees, bends, plugs, fire hydrants and appurtenances as may be specified on the plans, shall be provided with thrust backing and/or harness in accordance with Standard Drawings.

Thrust backing shall be of Class "B" concrete conforming with requirements of Section 90 of the Standard Specifications cast in place between solid ground and the fittings to be anchored. The backing shall be so placed that the pipe and fitting joint will be accessible for repair.

g. Valves - A valve box or masonry pit shall be provided for every valve.

A valve box shall be provided for every valve which has no gearing or operating mechanism or in which the gearing or operating mechanism is fully protected with a cast iron grease case. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve, with the box cover flush with the surface of the finished pavement or such other level as may be directed.

A masonry valve pit shall be provided for every valve which has exposed gearing or operating mechanisms. The valve nut shall be readily accessible for operation through the opening in the manhole, which shall be set flush with the surface of the finished pavement or such other level as may be specified. Pits shall be so constructed as to permit minor valve repairs and afford protection to the valves and pipe from impact where they pass through the pit walls.

h. Fire Hydrants - All fire hydrants shall stand plumb and shall have their outlets parallel with or at right angles to the curb or road centerline with the steamer outlet facing the curb or road centerline, except that hydrants having two hose outlets 90 degrees apart shall be set with each outlet facing the curb or road centerline at an angle of 45 degrees. Hydrants shall be set to the established grade, with outlets a minimum of 18 inches and a maximum of 30 inches above the ground or as otherwise shown on the plans. In the SRA, hydrants shall be set 18 inches above the established grade.

3. Water Storage

Storage facilities shall be provided where necessary to meet the demands of the water system.

Steel storage tanks shall conform to A.W.W.A. D 100 specifications and shall be painted in accordance with A.W.W.A. D 102 specifications.

Other tanks such as wood tanks, hydropneumatic tanks, reinforced concrete tanks and ground storage reservoirs may be acceptable, subject to the approval of the Engineer. Request for approval of any of these facilities shall be accompanied by

complete specifications and design calculations.

4. Pressure Testing

a. Hydrostatic Test - After the pipe has been laid and backfilled, said pipe shall be subjected to a hydrostatic pressure no less than the full rated (Maximum recommended) pressure class of the pipe plus an additional 50 p.s.i.

The duration of each test shall be 30 minutes unless otherwise directed by the Engineer.

Each section of pipeline shall be slowly filled with water, and the specified test pressure, measured at the point of lowest elevation, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe connection, and all necessary apparatus, shall be furnished by the Contractor.

During the filling of the pipe and before applying the specified test pressure, all air shall be expelled from the pipeline. To accomplish this, taps shall be made, if necessary, at points of highest elevation, and after completion of the test the taps shall be tightly plugged unless otherwise specified.

During the test, all exposed pipes, fittings, valves, hydrants and joints shall be carefully examined. Any part found to be cracked or defective shall not be accepted and shall be removed and replaced by the Contractor with new, sound material. The test shall then be repeated until satisfactory to the Engineer.

b. Leakage Test - Leakage tests shall be conducted after completion of the hydrostatic test and shall be made at not less than the normal working pressure of the system as determined by the Engineer.

No pipe installation will be accepted until or unless the leakage for the section of line tested is less than the rate specified in the following table.

LEAKAGE ALLOWANCE

Gallons per 1300 feet per hour*

Pipe Diam. (inches)	Test Pressure (psi) 50	75	100	125	150	200	225
4	1.54	1.87	2.16	2.42	2.65	3.07	3.25
6	2.30	2.80	3.25	3.63	3.98	4.50	4.88
8	3.07	3.73	4.33	4.83	5.30	6.13	6.50
10	3.83	4.66	5.41	6.04	6.63	7.66	8.12
12	4.60	5.59	6.50	7.25	7.95	9.20	9.75
14	5.37	6.52	7.58	8.46	9.28	10.73	11.38
16	6.13	7.45	8.66	9.66	10.60	12.27	13.00

Measurement of allowable leakage need not be made until after the pipe has been filled with water for a period of 24 hours.

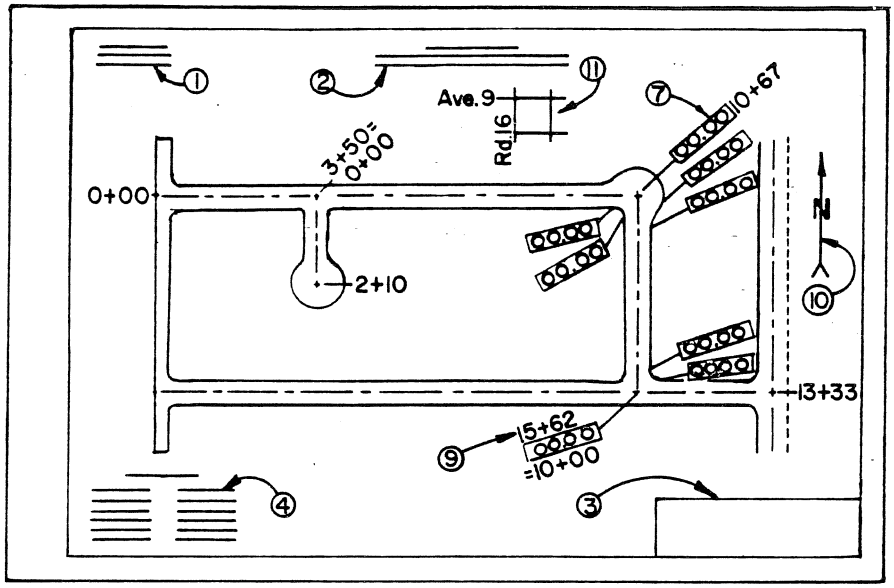
5. Disinfection

Disinfection of water mains shall be in accordance with A.W.W.A. Standard C 601. Special attention shall be given during pipe laying to keeping the pipe clean as outlined in Sections 1 through 4 of said standards.

Disinfection of storage tanks shall be in accordance with provisions of A.W.W.A. Standard D 102.

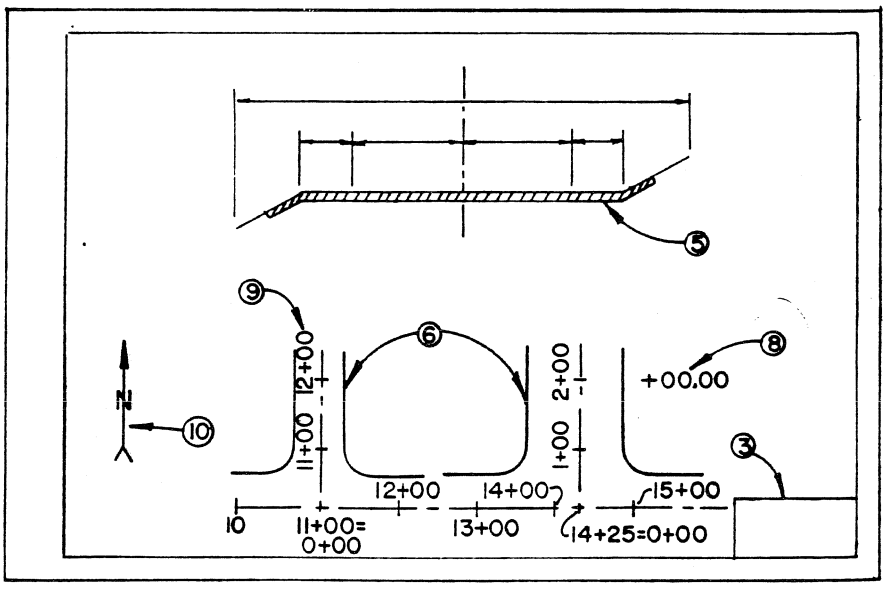
Following disinfection, samples will be taken and tests made by the Tulare County Department of Health Services for adequate disinfection. The Contractor shall request such tests and shall also provide the Engineer with evidence of Health Department acceptance.

* A.C. pipe/13 ft. joints. Leakage allowances for water pipelines constructed with other materials shall be determined by the Engineer.



Sheet No.1 Drainage layout showing all grade breaks, curb grades, catch-basins, storm drains, drainage channels, natural drainageways and other drainage works in sufficient detail; and showing lot line and location of fire hydrants, both proposed and existing; showing key map to show the relationship of subdivision to surrounding streets (scale 1" = 1000')

Standard sheet size-24"x36"
or 22"x 35"



Sheet No. 2 Typical cross sections and road approaches

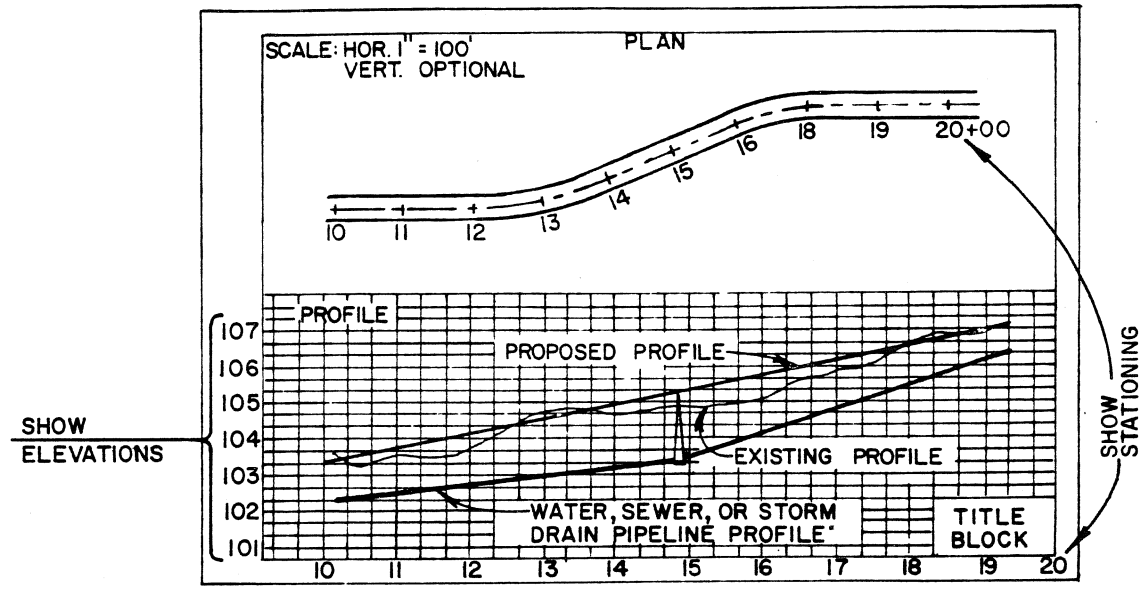
① Index of sheets
② Project title
③ Title Block
④ Conventional symbols or legend
⑤ Typical cross section
⑥ Road approaches
⑦ 00.00 Proposed elevation
⑧ 00.00 Existing Elevation
⑨ 0+00 Show Stationing
⑩ North Arrow
⑪ Key Map

PUBLIC ROAD STANDARDS

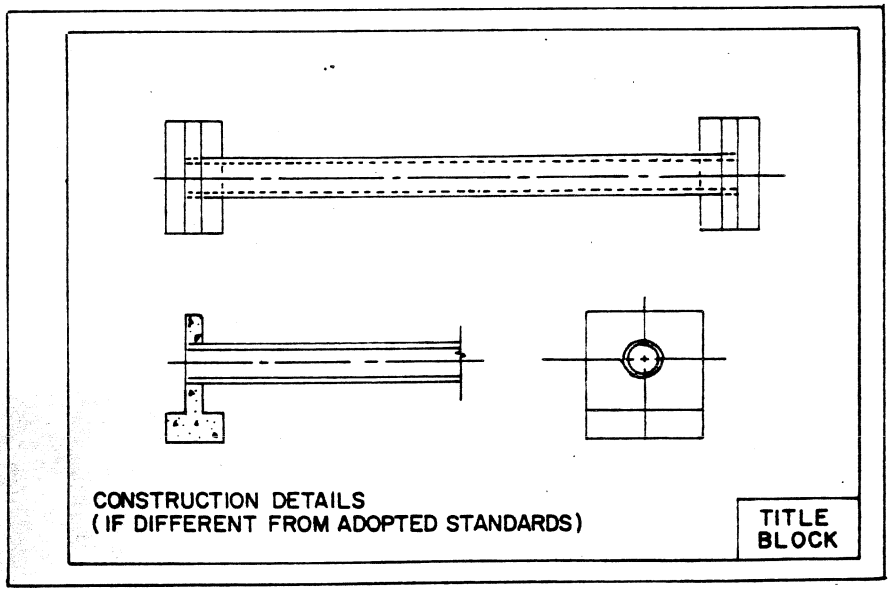
TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

TYPICAL IMPROVEMENT
PLAN LAYOUT

PLATE NO. 1



Sheet no. 3 to be used for utility plan and profiles, road grades with vertical curves and superelevation. Show elevations of all changes of grade in streets, pipelines, etc.



Remaining sheets following plan and profile to be used for construction details.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

TYPICAL IMPROVEMENT
PLAN LAYOUT

PLATE NO. 2

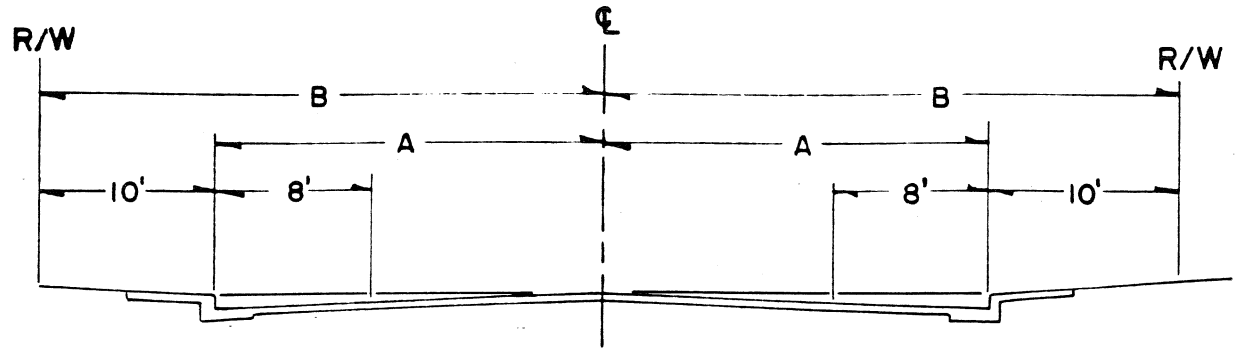
PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

APPROVAL AND TITLE BLOCK

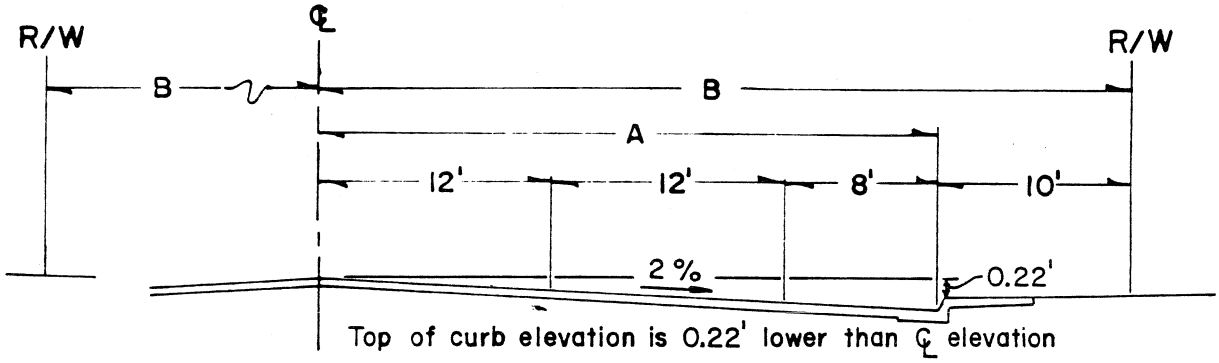
PLATE NO. 3

SUBDIVISION IMPROVEMENT PLANS COUNTY OF TULARE					SCALE
(NAME OF ENGINEERING FIRM)					DRAWN BY
					REVISED
(TRACT IDENTIFICATION)					
(TITLE OF SHEET)					
DESIGN ENGINEER _____ DATE _____ C.E. LICENSE NO. _____					SHEET _____OF _____SHEETS
REVISED					
APPROVAL					
APPROVED _____ COUNTY OF TULARE			C.E. LICENSE NO. _____ DATE _____		
REVISED					
APPROVAL					



CLASS 1, 2, & 3 TWO LANE ROADS

Top of curb elevation = centerline elevation



Top of curb elevation is 0.22' lower than ℄ elevation

CLASS 3 & SELECT SYSTEM FOUR LANE UNDIVIDED ROADS

* Note: The distance between face of curb and right of way and distance B may be reduced to 8 feet and 40 feet respectively on existing 80 foot right of ways. The chart below applies to urban areas with speed control zones, and select system roads outside such areas shall be designed to 60 m.p.h. minimum using a maximum super of 10%.

ROAD CLASS	NO. OF LANES	DESIGN VELOCITY	A MIN.	B MIN.	MAX. GRADE	MAX. SUPER
1	2	25 MPH	18	28	10%	6%
2	2	30 MPH	20	30	10%	
3	2	35 MPH	20	30	10%	
3	4	40 MPH	32	42*	8%	
SELECT	2	40 MPH	20	30	8%	
SELECT	4	50 MPH	32	42*	8%	

PUBLIC ROAD STANDARDS

VALLEY AREA

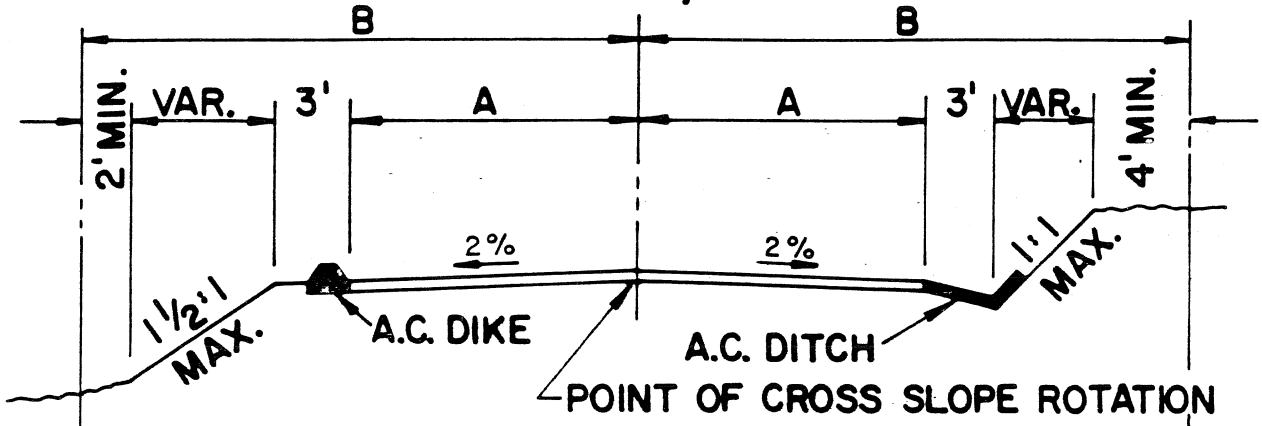
TULARE COUNTY ORDINANCE CODE SECTION No. 7080

GEOMETRIC SECTIONS

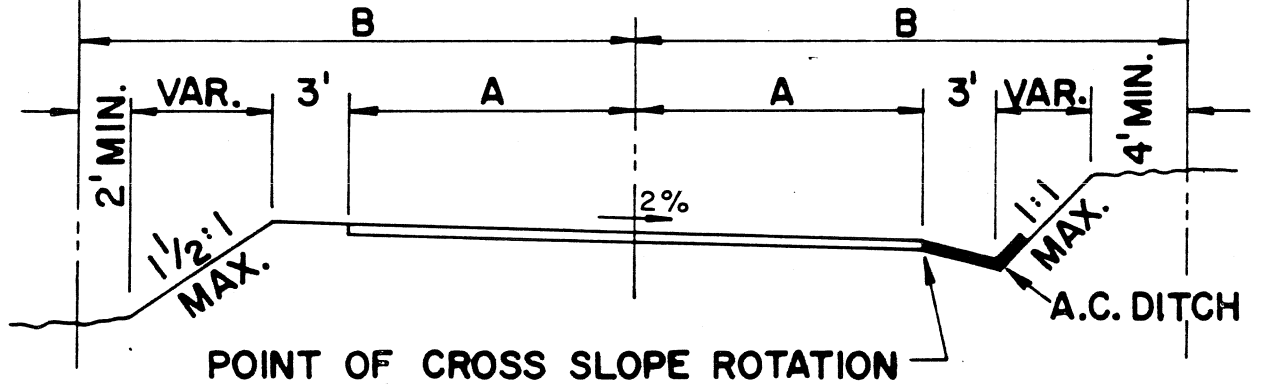
PLATE NO. A-1

FOR LOT AREAS 20,000 SQ. FT. OR MORE

CLASS 1, 2 & 3



CLASS 1 & 2 ALTERNATE



ROAD CLASS	LOCATION	DESIGN VELOCITY	A MIN.	B MIN.	MAX. GRADE
1	WINTER TRAFFIC ABOVE ELEV. 3000'	20 MPH	12'	25'	10 %*
2		20 MPH	13'	25'	10 %
3		30 MPH	14'	30'	10 %
1	BELOW ELEV. 3000'	20 MPH	12'	25'	15 %
2		20 MPH	13'	25'	12 %
3		30 MPH	14'	30'	10 %

* In very difficult terrain, grade up to 12 % will be permitted for short distances at locations approved by the Road Department.

PUBLIC ROAD STANDARDS

MOUNTAINOUS AREA

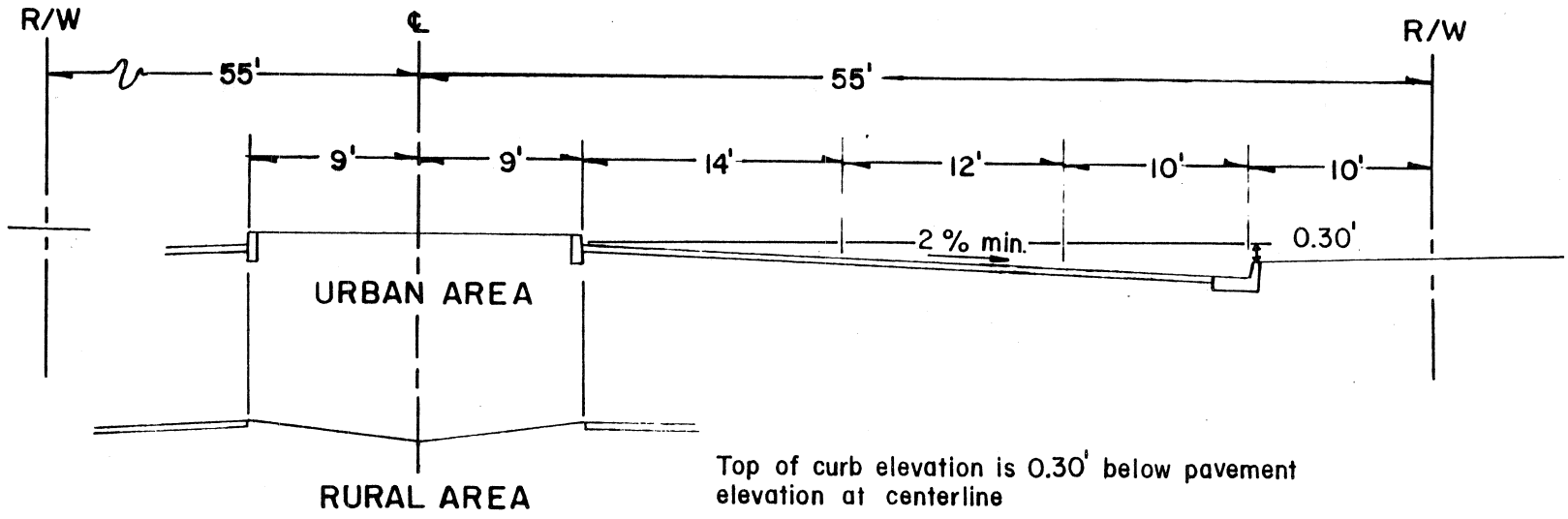
TULARE COUNTY ORDINANCE CODE SECTION No. 7080

GEOMETRIC SECTION FOR LOT AREAS 20,000 sq.ft. OR MORE

PLATE No. A-1M

PUBLIC ROAD STANDARDS

VALLEY AREA



Top of curb elevation is 0.30' below pavement elevation at centerline

SELECT SYSTEM FOUR LANE DIVIDED HIGHWAYS

ROAD LOCATION	MIN. DESIGN VELOCITY	MAX. GRADE	MAX. SUPER
Rural Areas	60 m.p.h.	6%	10%
Urban Areas	50 m.p.h.	6%	6%

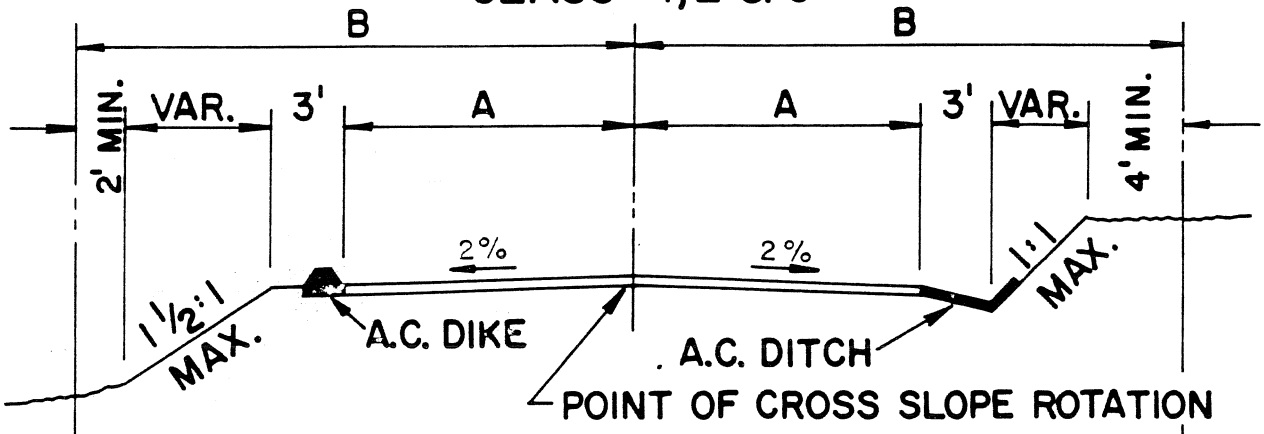
TULARE COUNTY ORDINANCE CODE SECTION No. 7080

SELECT SYSTEM GEOMETRICS

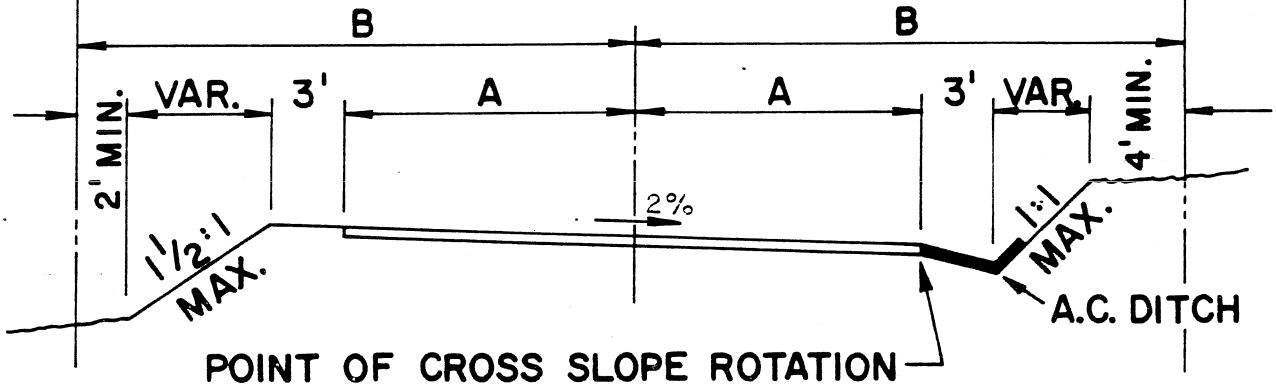
PLATE NO. A-2

FOR LOT AREAS LESS THAN 20,000 SQ. FT.

CLASS 1, 2 & 3



CLASS 1 & 2 ALTERNATE



ROAD CLASS	LOCATION	DESIGN VELOCITY	A MIN.	B MIN.	MAX. GRADE
1	WINTER TRAFFIC ABOVE ELEV. 3000'	20 MPH	16'	30'	10%*
2		20 MPH	17'	30'	10%
3		30 MPH	18'	30'	10%
1	BELOW ELEV. 3000'	20 MPH	16'	30'	15%
2		20 MPH	17'	30'	12%
3		30 MPH	18'	30'	10%

* In very difficult terrain, grade up to 12% will be permitted for short distances at locations approved by the Road Department.

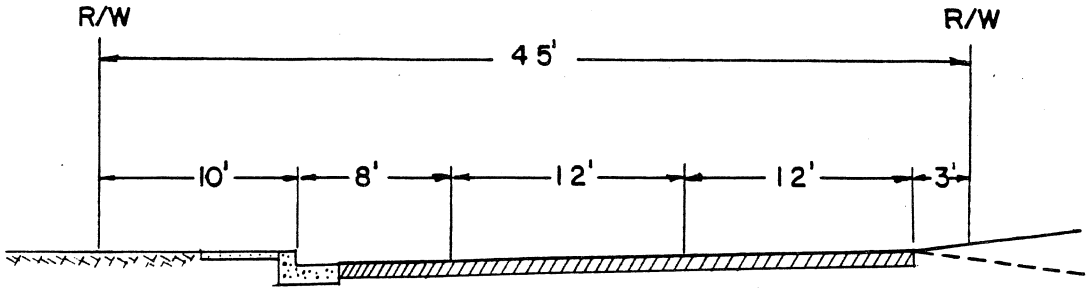
PUBLIC ROAD STANDARDS

MOUNTAINOUS AREA

TULARE COUNTY ORDINANCE CODE SECTION No. 7080

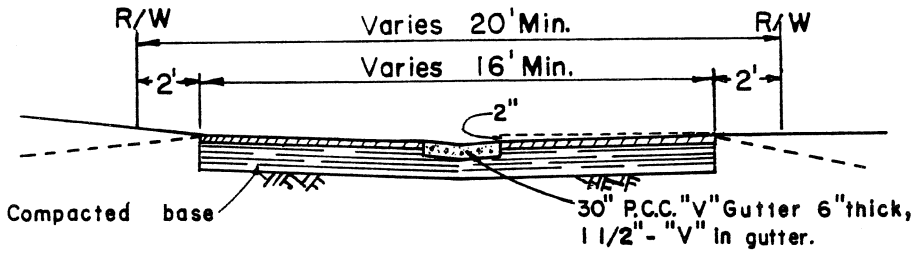
GEOMETRIC SECTIONS FOR LOT AREAS LESS THAN 20,000 sq. ft.

PLATE No. A-2M



Note: Grade and alignment shall be the same as the parallel contiguous highway.
Frontage roads shall enter four lane streets through Bulb Type Intersections.

FRONTAGE ROAD SECTION



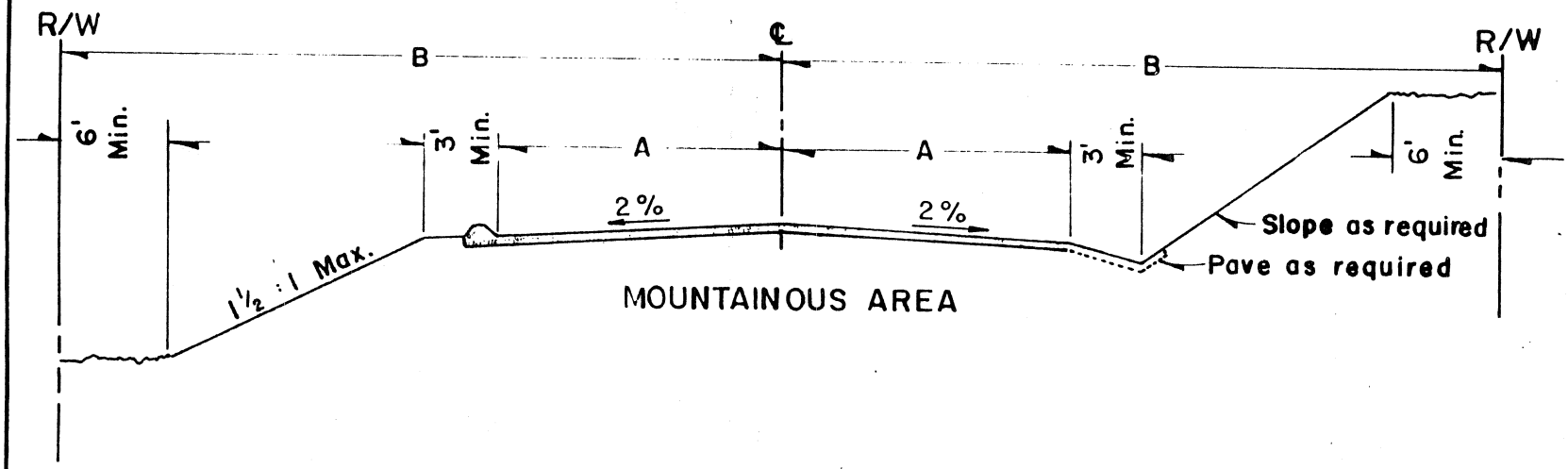
ALLEY SECTION

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION No. 7080
FRONTAGE ROAD AND ALLEYS
PLATE No. A-3

PUBLIC ROAD STANDARDS

MOUNTAINOUS AREAS



ROAD CLASS	LOT SIZE	DESIGN VELOCITY	A MIN *	B MIN	MAX. GRADE.
Collector	20,000 sq.ft.	35 m.p.h.	14' or 16'	30'	10%
Arterial	or more	40 m.p.h.	16'	40'	8%
Collector	Less than	35 m.p.h.	18' or 20'	30'	10%
Arterial	20,000 sq.ft.	40 m.p.h.	20'	40'	8%

*Paved width dependent upon traffic volume.

TULARE COUNTY ORDINANCE CODE SECTION No. 7080

TWO-LANE SELECT SYSTEM ROAD

PLATE NO. A-3M

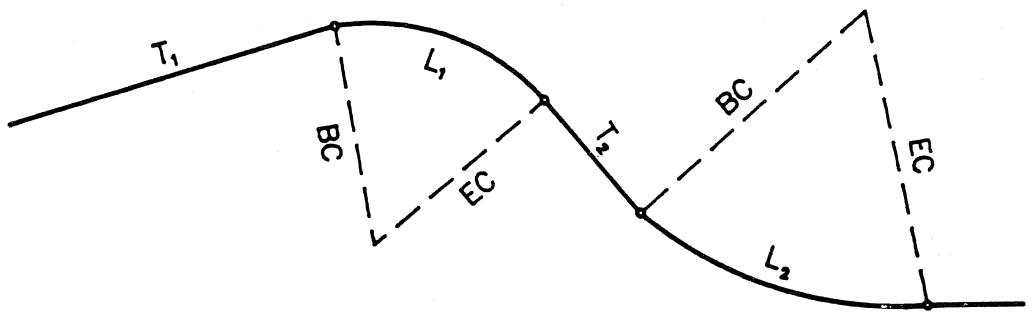


TABLE OF MINIMUM CURVE RADII (R)								
V / S	20	25	30	35	40	50	60	70
NONE*	125	235	375	585	820	1385	2180	3270
.02	105	190	300	455	630	1040	1600	2330
.04	95	175	275	410	560	925	1410	2040
.06	90	160	250	375	510	835	1260	1815
.08						760	1140	1635
.10						695	1040	1485

* Design based on S = −0.02

TABLE OF MINIMUM TANGENT LENGTHS (T)								
V / S_1+S_2	20	25	30	35	40	50	60	70
.02	←		NONE		→	300	↑	↑
.04	←		NONE		→	325	375	
.06	20	25	30	35	40	350		425
.08	40	50	60	70	80	375	↓	
.10	60	75	90	105	120	400	400	
.12	80	100	120	140	160	425	425	↓
.14						450	450	450
.16						475	475	475
.18						500	500	500
.20						525	525	525

TABLE OF MINIMUM ARC LENGTHS (L) FOR VARIOUS DESIGN VELOCITIES								
V	20	25	30	35	40	50	60	70
L	80	100	120	140	160	300	360	420

V	F
20	.24
25	.20
30	.18
35	.16
40	.15
50	.14
60	.13
70	.12

$$R = \frac{V^2}{15(F+S)}$$

WHERE
R = Radius in feet
V = Velocity in M.P.H.
S = Superelevation in ft./ft.
F = Friction factor

NOTES:

1. See Plate A–5 for other applicable formuli
2. In the State Responsibility Area, add 4 feet additional surface width for R < 100 feet and 2 feet for 100 < R < 200 feet

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

CURVE DESIGN
RADII & TANGENTS

PLATE NO. A–4

$L = 50VS$

$T\ min. = 50V(S_1 + S_2 - .04) = L_1 + L_2 - 2B$

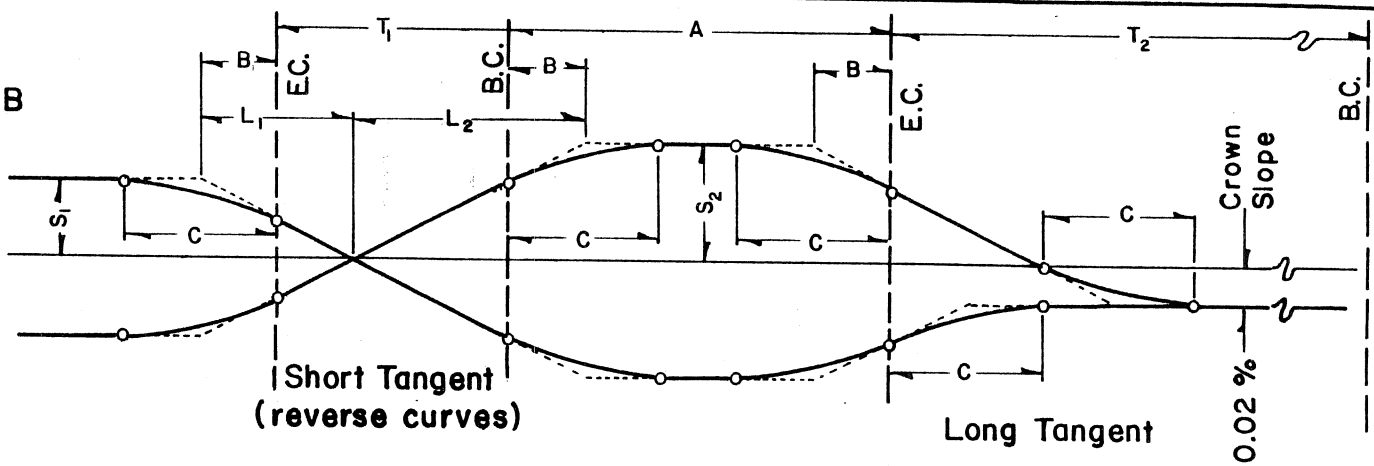
$A\ min. = 4V$

$B = V$

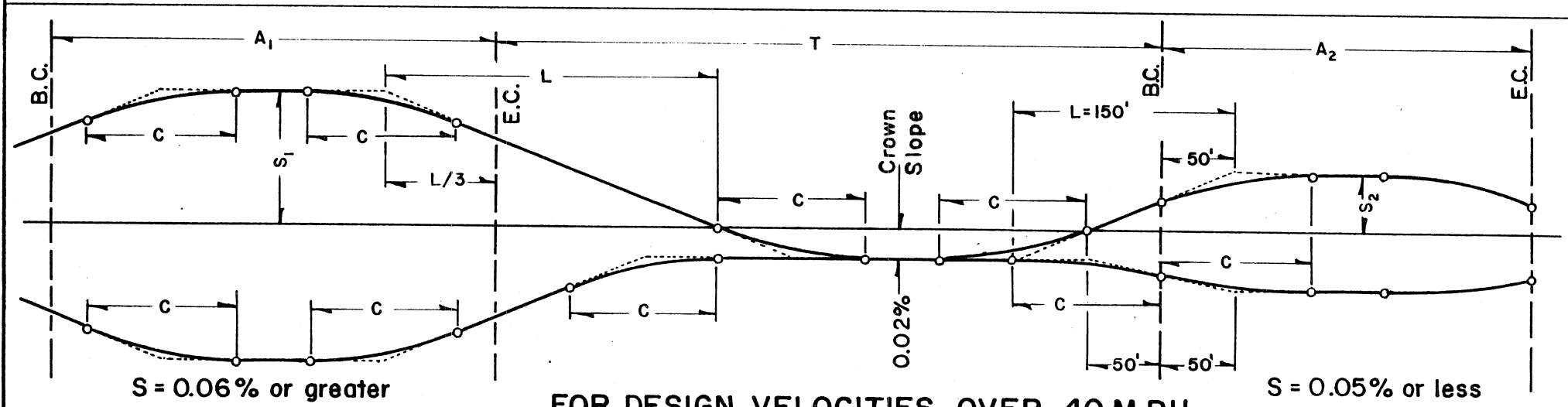
$C = 2V$

V = Design Velocity in M.P.H.

S = Superelevation, ft./ft.
(max. = 0.06 ft./ft.)



FOR DESIGN VELOCITIES 40 M.P.H. OR LESS



FOR DESIGN VELOCITIES OVER 40 M.P.H.

$L = 2500 \times S$, 150' min.

$T\ min.$, See Plate A-4

$A\ min. = 6Y$

$C = 100'$

V = Design Velocity in M.P.H.

S = Superelevation, ft./ft. (0.10 max.)

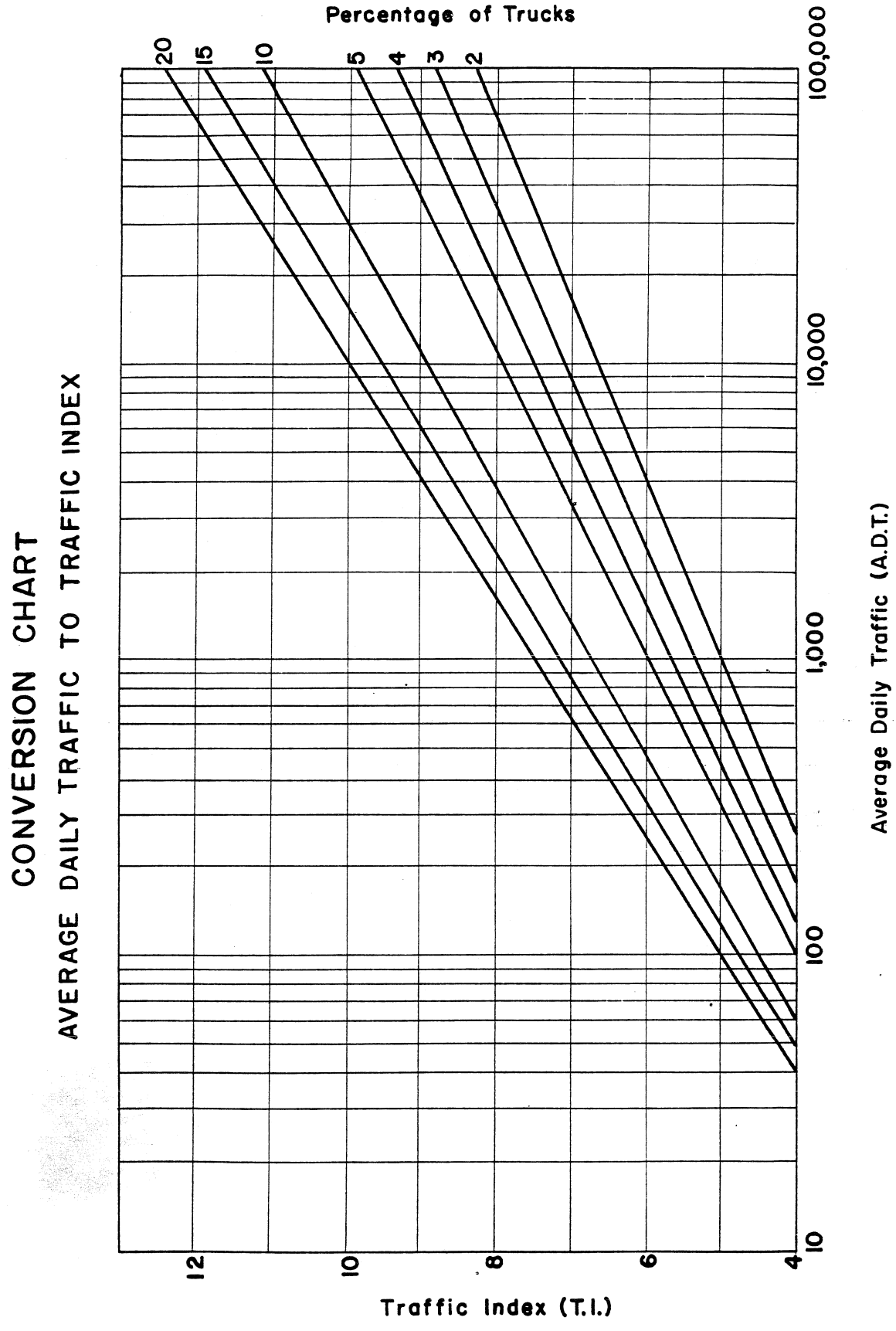
See Plate A-3 for table of min. values

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

CURVE DESIGN
SUPERELEVATION

PLATE NO. A-5



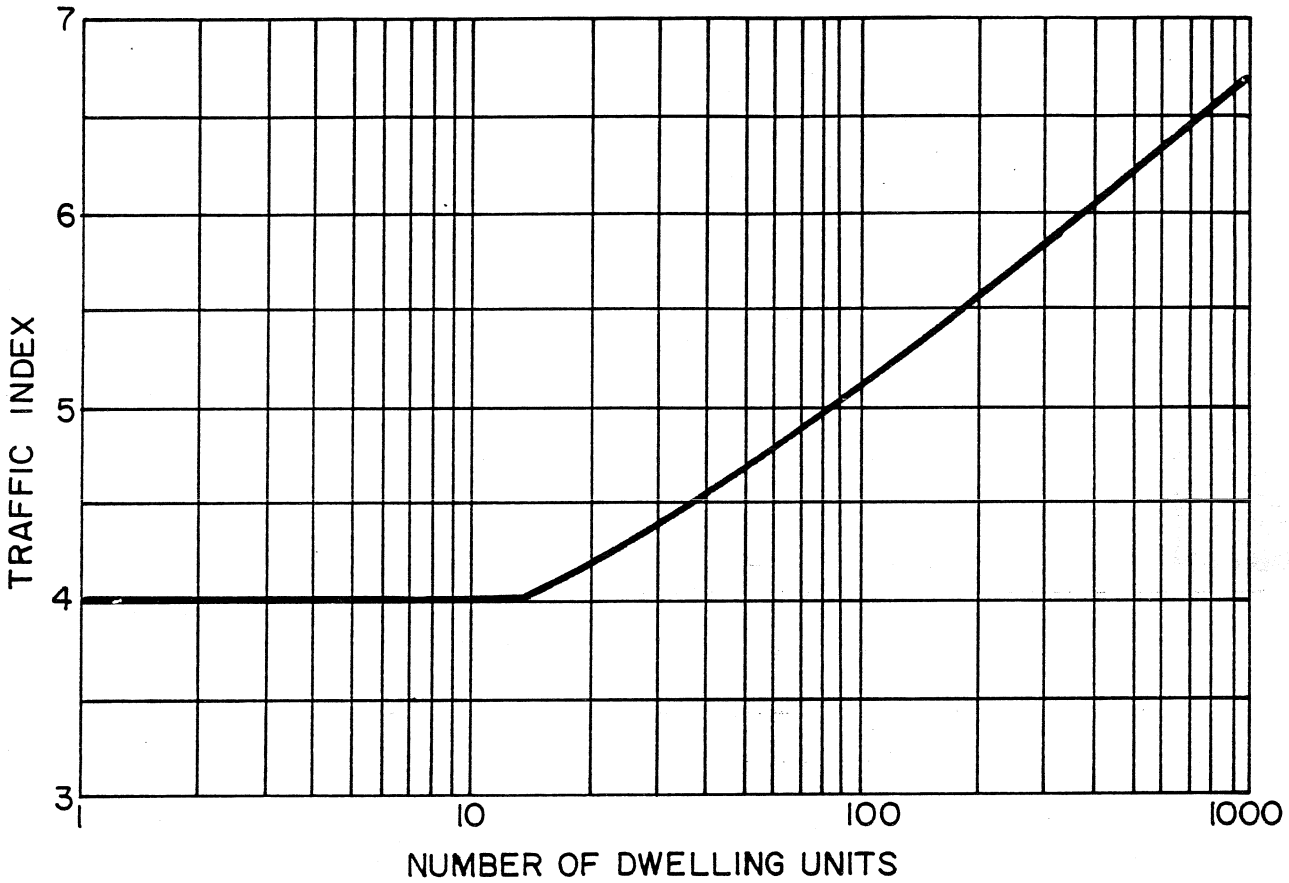
PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

TRAFFIC INDEX
TO A. D. T.

PLATE NO. A-6

CHART FOR ESTIMATION OF TRAFFIC INDEX FROM NUMBER OF DWELLING UNITS



Notes: For use only within subdivisions for residential and residential collector streets.

Chart is based on a 10 year design life.

Where the number of dwelling units cannot be accurately determined, the following traffic indexes shall be used:

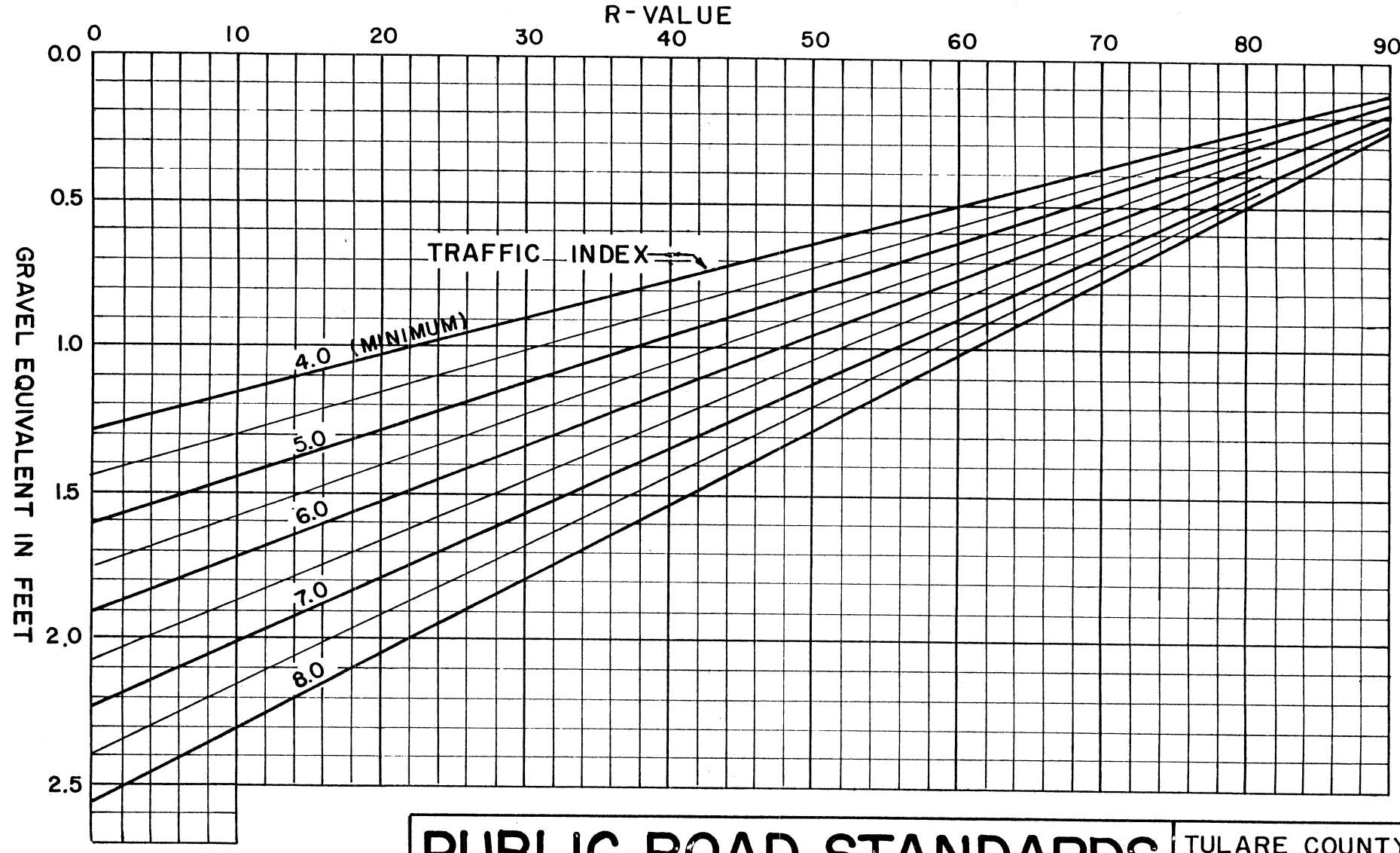
Class of road	T. I.
1	4.5
2	5.0
3	5.5

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION No. 7080

TRAFFIC INDEX TO DWELLING UNITS

PLATE NO. A-7



GE = 0.0032 (TI)(100-R)

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

STRUCTURAL DESIGN
CHART FOR FLEXIBLE
PAVEMENT

PLATE NO. A-8

AC x .8 for RMAS

ACTUAL THICKNESS IN FEET	GRAVEL EQUIVALENT IN FEET													
	ASPHALT CONCRETE					ROAD-MIXED ASPH. SURFACING				Cl. 2 AB	Cl. 4 ASB	LTB	LTB	Cl. B BTB
	T. I.	5.0 & BELOW	5.5 6.0	6.5 7.0	7.5 8.0	5.0 & BELOW	5.5 6.0	6.5 7.0	7.5 8.0					
	FACTOR Gf	2.50	2.32	2.14	2.01	2.00	1.86	1.71	1.61	1.10	1.00	1.40	1.20	1.20
0.13 Min.		0.32												
0.15		0.38	0.35											
0.20		0.50	0.46	0.43		0.40								
0.25		0.63	0.58	0.54	0.50	0.50	0.47							
0.30		0.75	0.70	0.64	0.60	0.60	0.56	0.51						
0.35		0.88	0.81	0.75	0.70	0.70	0.65	0.60	0.56	0.39	0.35			
0.40		1.00	0.93	0.86	0.80	0.80	0.74	0.69	0.64	0.44	0.40			
0.45			1.04	0.96	0.90	0.90	0.84	0.77	0.72	0.50	0.45	0.63	0.54	0.54
0.50			1.16	1.07	1.01	1.00	0.93	0.86	0.81	0.55	0.50	0.70	0.60	0.60
0.55				1.18	1.11		1.02	0.94	0.89	0.61	0.55	0.77	0.66	0.66
0.60					1.21			1.03	0.97	0.66	0.60	0.84	0.72	0.72
0.65					1.31				1.05	0.72	0.65	0.91	0.78	0.78
0.70										0.77	0.70	0.98	0.84	0.84
0.75											0.75	1.05	0.90	0.90
0.80											0.80	1.12	0.96	0.96

REVISED - SEE C.T.C. STANDARDS

A. Solid line indicates minimum thickness allowed.

B. T. I. values shall be rounded to the nearest one half.

Old Plate A-9

ACTUAL THICKNESS IN FEET	GRAVEL EQUIVALENT IN FEET												
	ASPHALT CONCRETE					ROAD-MIXED ASPH. SURFACING				AB	CL. "B" CTB,	CL. "C" CTB, BTB, LTB	CL. "D" CTB & ASB
	T. I.	5 & BELOW	5.5 6.0	6.5 7.0	7.5 8.0	5 & BELOW	5.5 6.0	6.5 7.0	7.5 8.0				
	FACTOR Gf	2.50	2.32	2.14	2.01	1.50	1.40	1.30	1.20	1.1	1.2	1.2	1.0
0.13 MIN.		0.32											
0.15		0.38	0.35										
0.20		0.50	0.46	0.43		0.30							
0.25		0.63	0.58	0.54	0.50	0.38	0.35						
0.30		0.75	0.70	0.64	0.60	0.45	0.42						
0.35		0.88	0.81	0.75	0.70	0.53	0.49	0.45		0.39			0.35
0.40		1.00	0.93	0.86	0.80	0.60	0.56	0.52	0.48	0.44			0.40
0.45			1.04	0.96	0.90	0.68	0.63	0.59	0.54	0.50	0.68	0.54	0.45
0.50			1.16	1.07	1.01	0.75	0.70	0.65	0.60	0.55	0.75	0.60	0.50
0.55				1.18	1.11		0.77	0.72	0.66	0.61	0.83	0.66	0.55
0.60					1.21			0.78	0.72	0.66	0.90	0.72	0.60
0.65					1.31				0.78	0.72	0.98	0.78	0.65
0.70										0.77	1.05	0.84	0.70
0.75											1.13	0.90	0.75
0.80											1.20	0.96	0.80

A. Solid line indicates minimum thickness allowed.

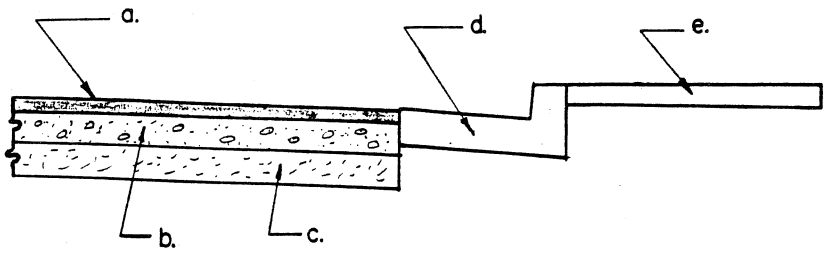
B. T. I. values shall be rounded to the nearest one half.

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

GRAVEL EQUIVALENTS AND MIN. THICKNESS

PLATE NO. A-9



APPLICABLE TO VALLEY IMPROVEMENT STANDARDS

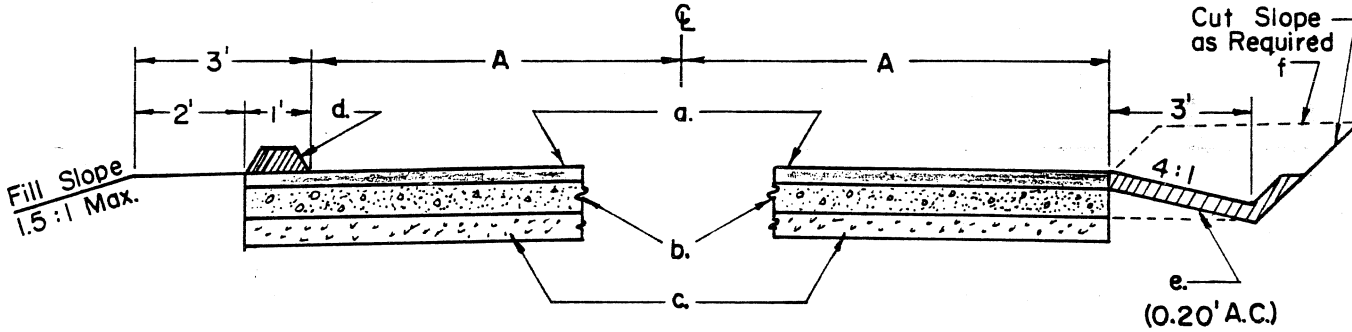
a. Type "B "Asphalt Concrete pavement.

b. Class "2" Aggregate Base.

c. Class "4" Aggregate Subbase if required by design.

d. Standard Type Curb.

e. Sidewalks where required.



APPLICABLE TO MOUNTAIN IMPROVEMENT STANDARDS

a. Type "B " Asphalt Concrete or Road Mixed Asphalt Surfacing.

b. Class "2 " or Class "3" Aggregate Base.

c. Class "4" Aggregate Subbase if required by design.

d. Standard Asphalt Concrete Dike. May be eliminated where fill slope are flatter than 6:1 and erosion is not anticipated.

e. Paved Roadside Ditch. Pavement may be eliminated on grades flatter than 4% if erosion is not probable.

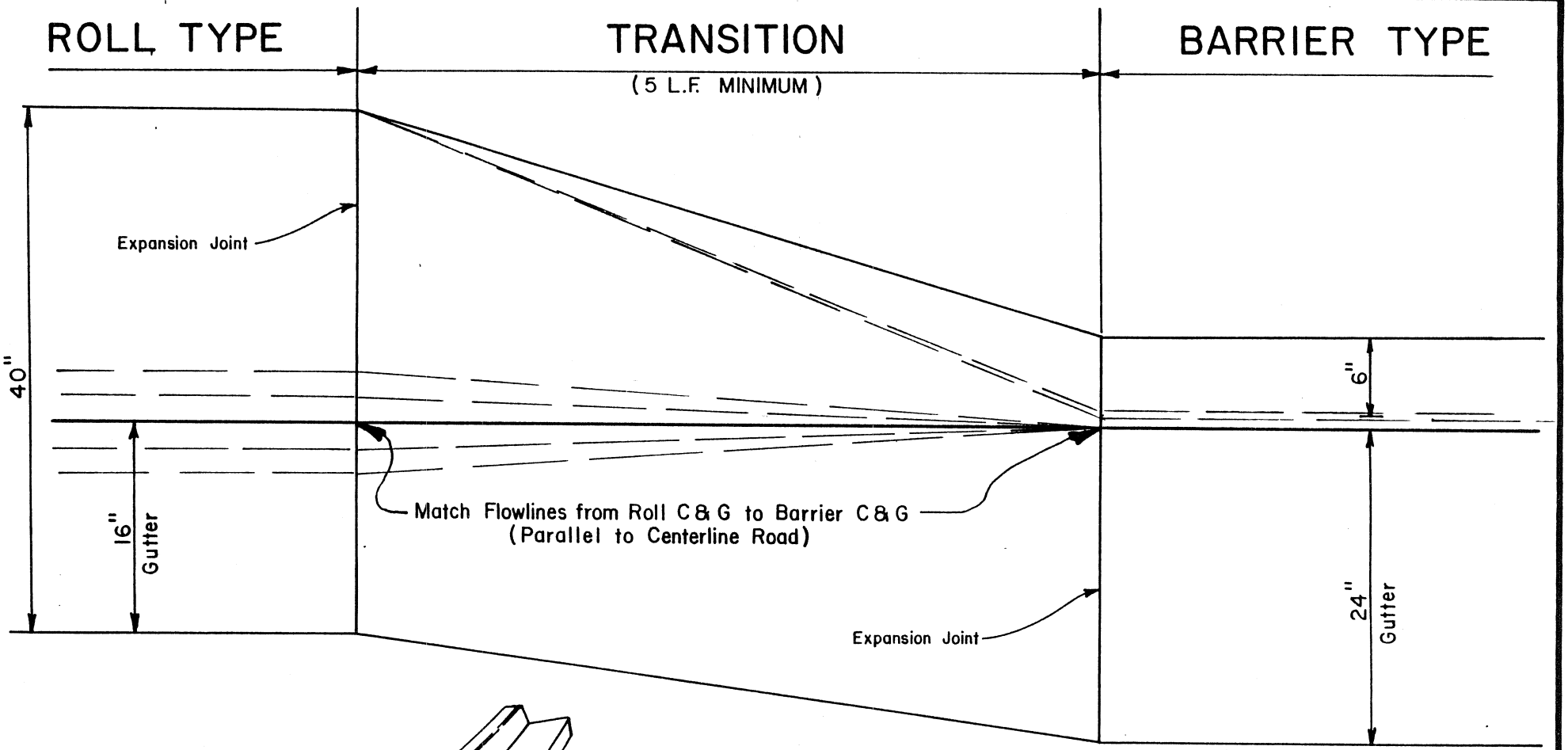
f. The roadside ditch (e) may be eliminated where paved width 'A' is 17' or greater and ditch is not needed to carry calculated gutter flow.

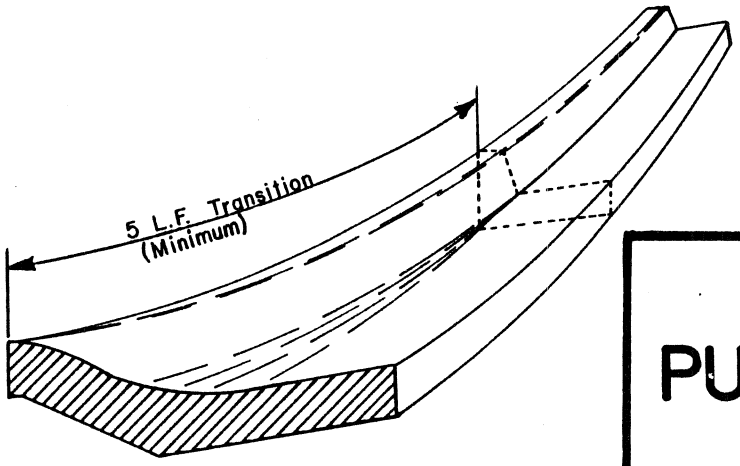
PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

STRUCTURAL
ROAD DETAILS

PLATE NO. A-10



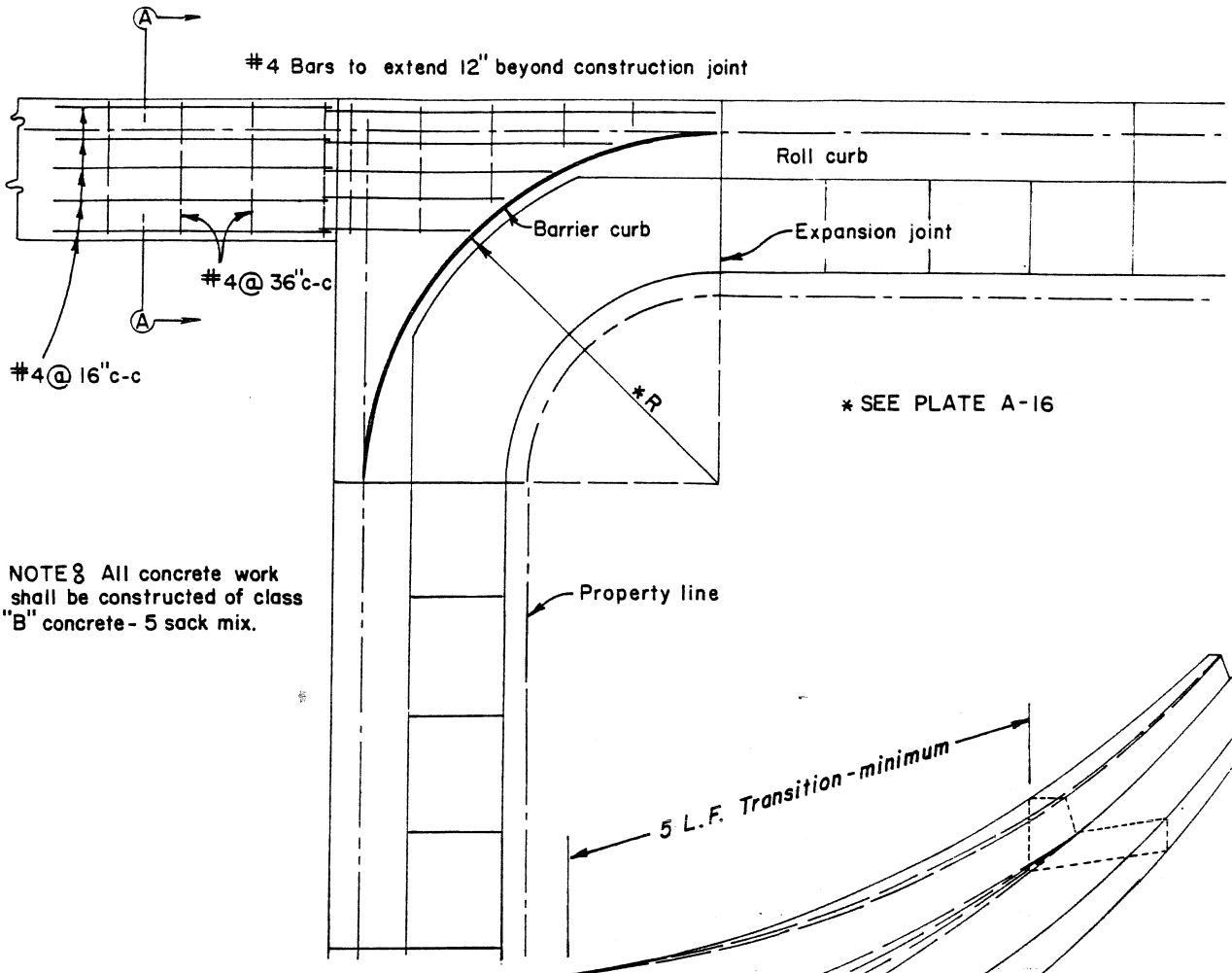


PUBLIC ROAD STANDARDS

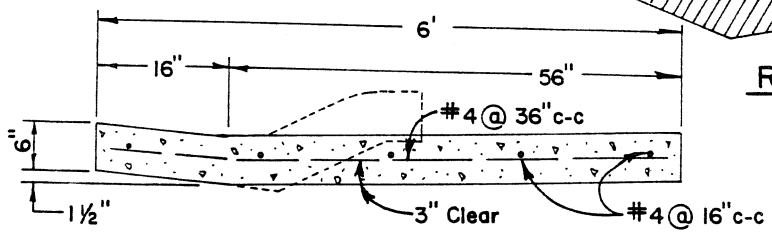
TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

CURB AND GUTTER
TRANSITION
ROLL TO BARRIER

PLATE NO. A-13



ROLL TO BARRIER TRANSITION



SECTION A – A

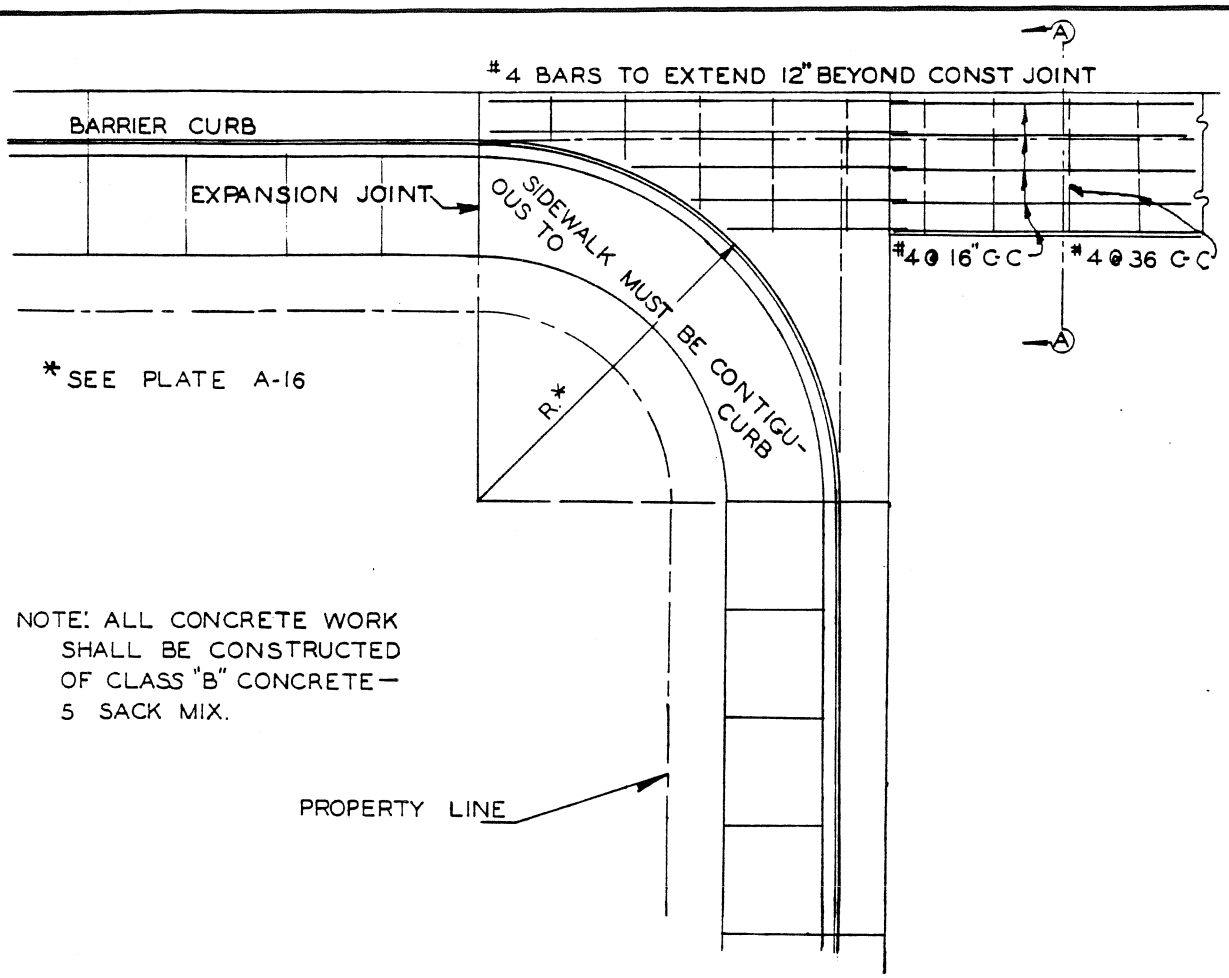
REVISED 9-5-89

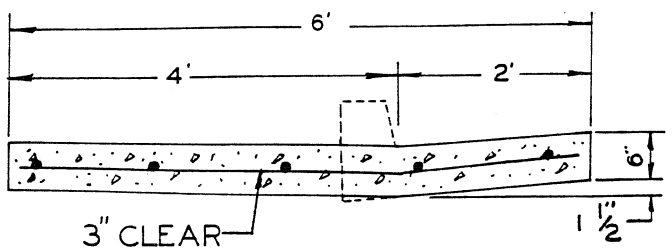
PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

CONTINUOUS GUTTER TRANSITION

PLATE NO. A-14





APPLICABLE USE WITH BARRIER TYPE CURB

SECTION A-A

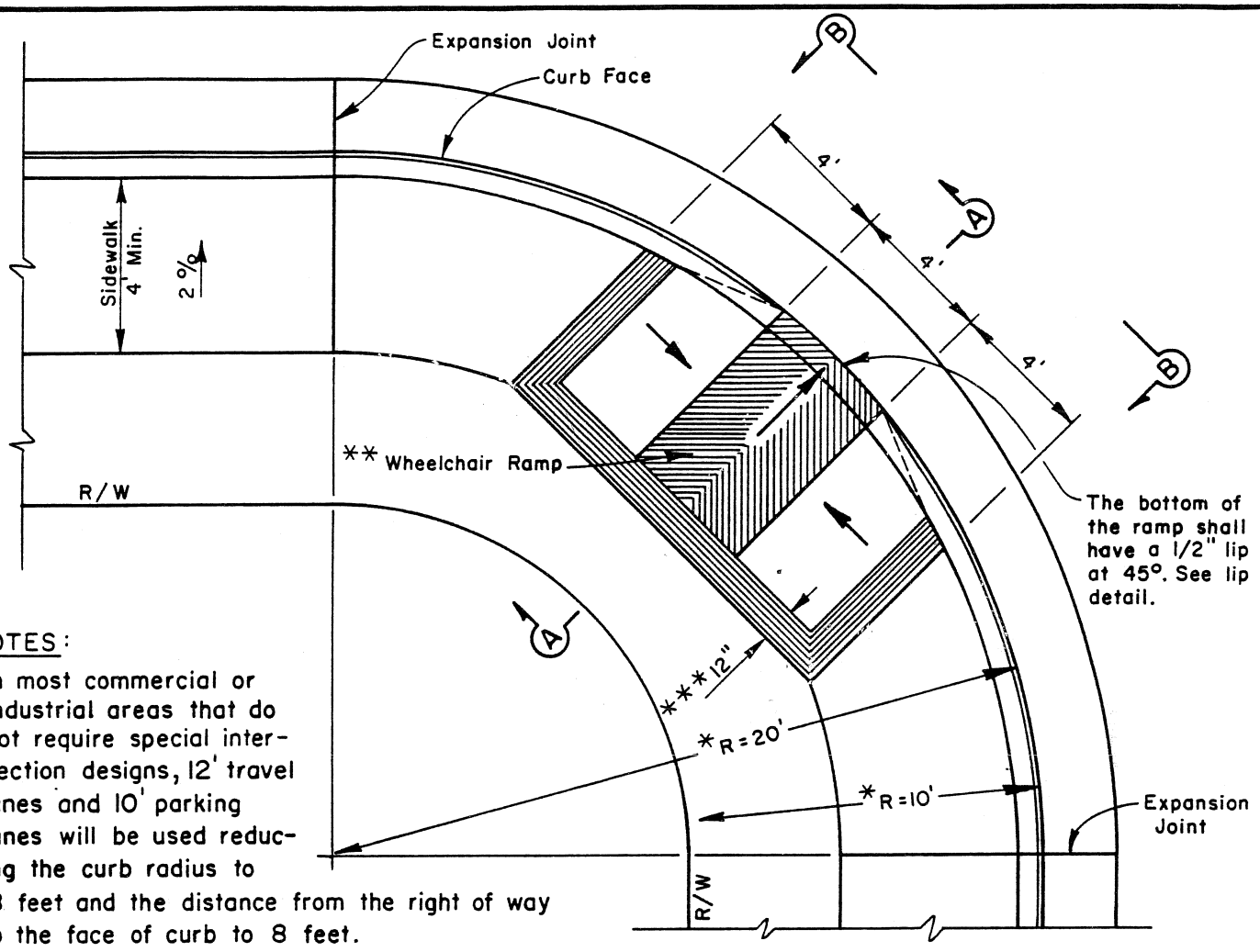
REVISED 9-5-89

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

CONTINUOUS GUTTER CURB RETURN

PLATE NO. A-15

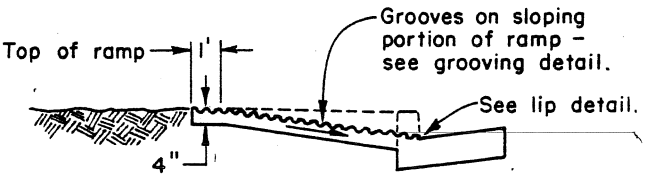


NOTES:

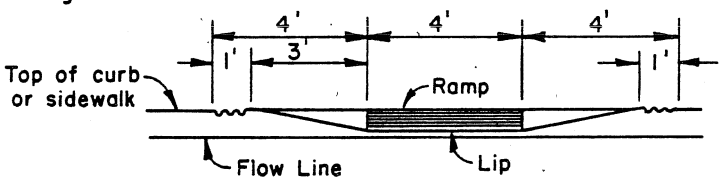
* In most commercial or industrial areas that do not require special intersection designs, 12' travel lanes and 10' parking lanes will be used reducing the curb radius to 18 feet and the distance from the right of way to the face of curb to 8 feet.

** Wheelchair ramps shall be located in the center of curb return. It shall be grooved in a herringbone pattern with 1/4" grooves approximately 1 1/2" o.c. See grooving detail. Grooves should be aligned parallel to crosswalk stripes to direct blind pedestrians into the correct crosswalk.

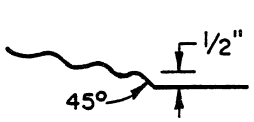
*** The ramp shall have a 12" wide border with 1/4" grooves approximately 3/4" o.c. See grooving detail.



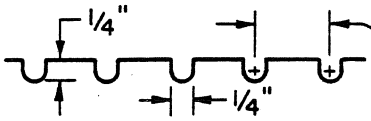
SECTION A-A



SECTION B-B



LIP DETAIL



GROOVING DETAIL

Approximately 3/4" at border and 1 1/2" on sloping portion of ramp.

REVISED 9-89

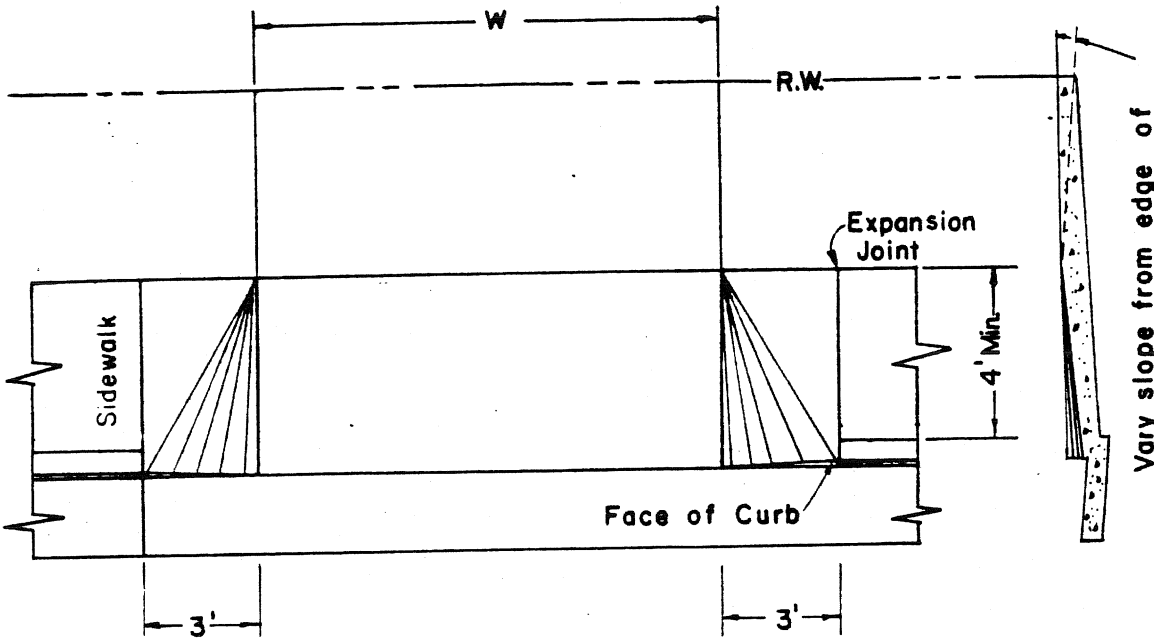
PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION No. 7080

CURB RETURN DETAIL

PLATE A-16

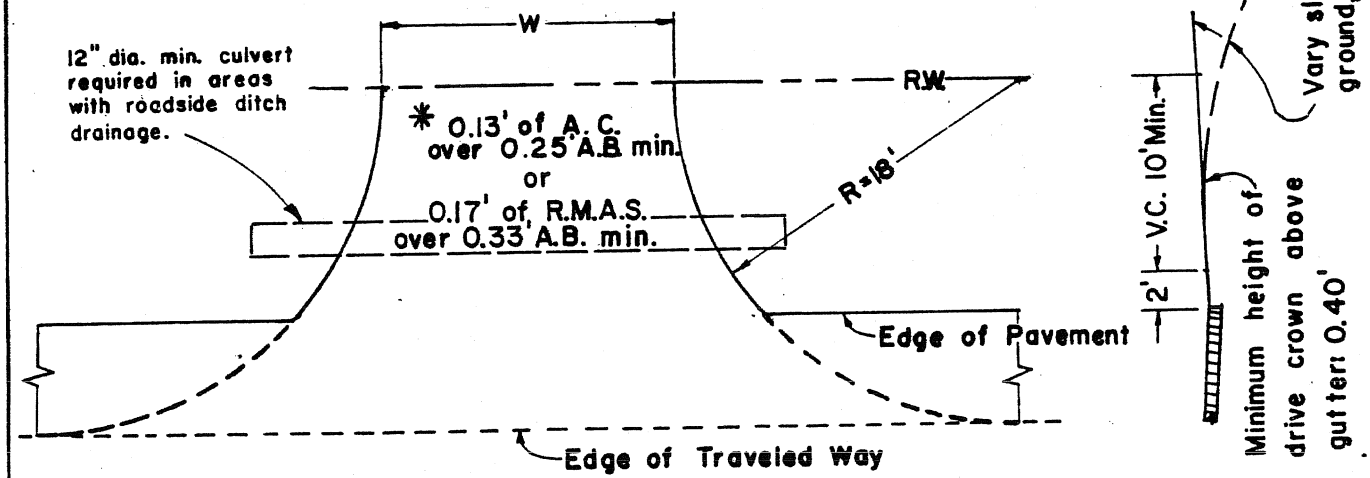
NOTE: Driveway approaches need only to extend to the back of sidewalk location where approved by the engineer and A.C. pavement continues.



NOTE: See sheet A-18 for further details of concrete driveway.

URBAN DRIVEWAY

* NOTE:
If County maintained road is surfaced with A.C. then A.C. approach is required. If County maintained road is R.M.A.S. surfacing then R.M.A.S. or A.C. approach is required.



RURAL DRIVEWAY

TYPE	W-MIN.	W-MAX.
Residential	9'	24'
Commercial	15'	35'

NOTES:
1. All commercial drives shall be of urban type except in mountain areas where approved by Engineer.
2. Where drives are constructed on diked roads, the A.C. dike shall be extended down the drive to R.W.

REVISED	7-10-79	G.R.M.

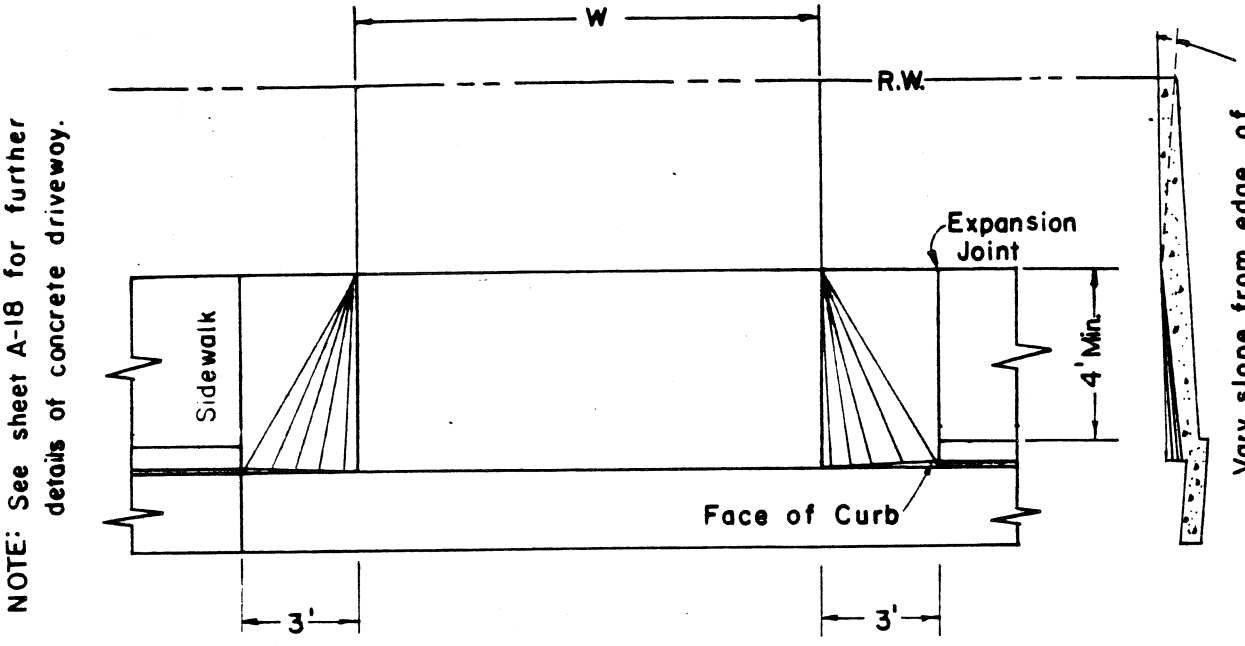
PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION .. NO.7080

DRIVEWAY DETAILS

PLATE NO. A-17

NOTE: Driveway approaches need only to extend to the back of sidewalk location where approved by the engineer and A.C. pavement continues.

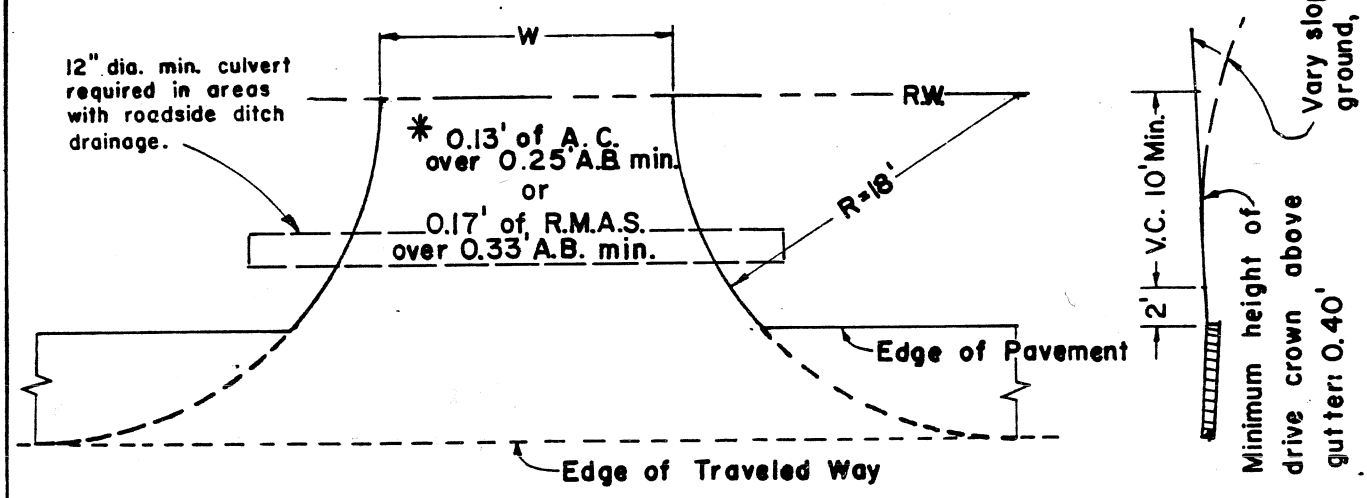


NOTE: See sheet A-18 for further details of concrete driveway.

URBAN DRIVEWAY

* NOTE:

If County maintained road is surfaced with A.C. then A.C. approach is required. If County maintained road is R.M.A.S. surfacing then R.M.A.S. or A.C. approach is required.



RURAL DRIVEWAY

TYPE	W-MIN.	W-MAX.
Residential	9'	24'
Commercial	15'	35'

NOTES:

1. All commercial drives shall be of urban type except in mountain areas where approved by Engineer.
2. Where drives are constructed on diked roads, the A.C. dike shall be extended down the drive to R.W.

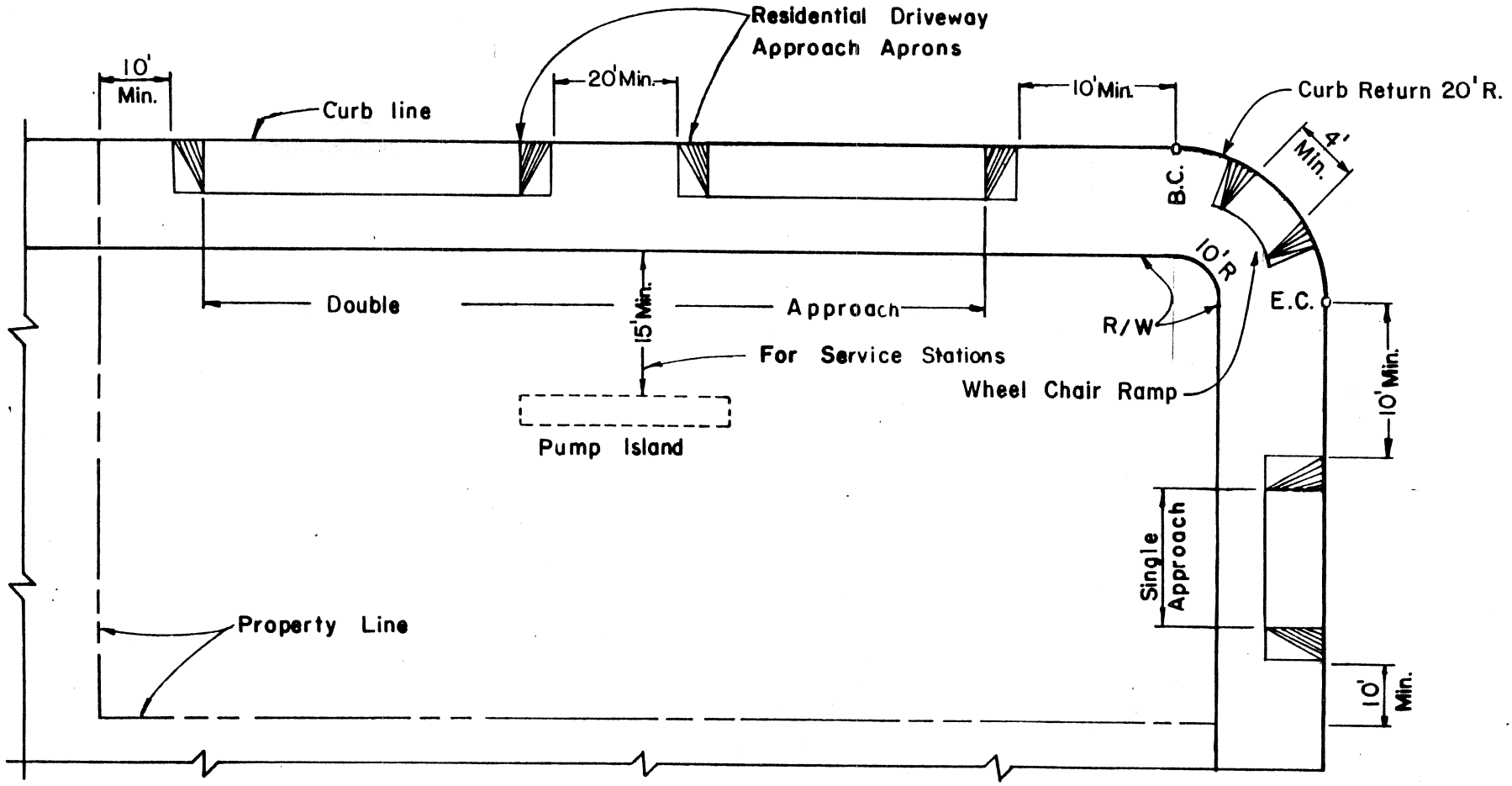
REVISED	7-10-79	G.R.M.

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION .. NO. 7080

DRIVEWAY DETAILS

PLATE NO. A-17



Notes:

Not more than 60% of frontage to be in driveway opening, measured at Property Line.

For Driveway Approach Details see plate no. A-18

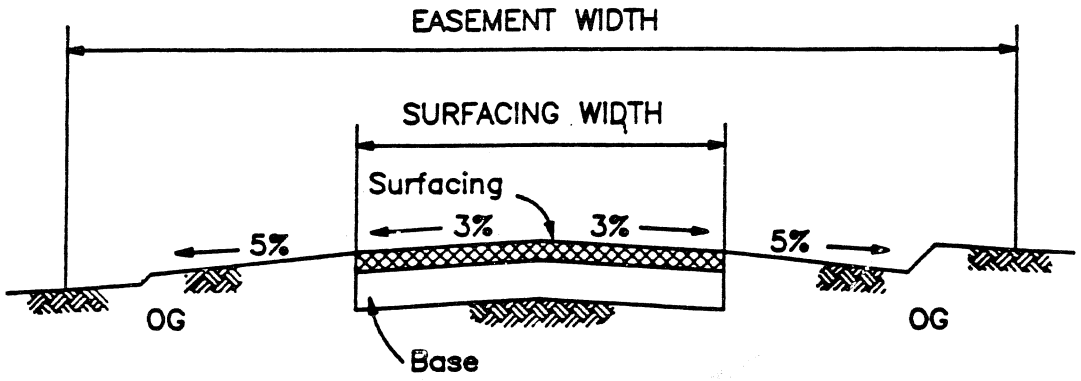
For Curb Return Details see plate No. A-16

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

COMMERCIAL
DRIVEWAY APPROACH

PLATE NO. A-17A



EASEMENT AND SURFACING WIDTHS ***		
NO. OF PARCELS TO BE SERVED *	EASEMENT WIDTH (ft.)	PAVEMENT WIDTH (ft.)
1	18	10
2	18	16
3	20	18
4	26	20

STRUCTURAL SECTION (minimum) ***		
NO. OF PARCELS TO BE SERVED *	BASE	SURFACING
1–2	3" AB(3)	OIL PENETRATION **
3	3" AB(3)	1.5" RMAS or AC
4	AB (3)	RMAS or AC
	Use TI = 4.0 for thickness	

NOTES:

1. A 37' paved radius turnaround bulb shall be constructed within a 45' easement radius at the end of access easements serving 2,3, and 4 parcels. In the SRA, turnarounds will also be required for access easements serving one parcel with more than two buildings or four or more dwelling units. Turnaround bulbs shall be paved to a 40' radius within a 48' easement radius.
2. Private Vehicular Access connections to County roads shall be constructed in accordance with Plate No. A–17.
3. When more than four parcels are served, County Road Standards for right–of–way, surfacing widths, and structural section shall apply.
4. When RMAS is used, the oil quantity and the quality of aggregate will be tested using test method No. Calif. 304 and other tests as required in Section III–B6 of these standards.
5. Compaction of OG and AB shall be to a minimum of 90% relative compaction. Compliance tests will be taken as directed by the Public Works Director.
6. Improvement Standards for public roads shall be applicable for those standards not specifically stated in these Private Vehicular Access Easement Standards.

ABBREVIATIONS

RMAS	= ROAD MIX ASPHALT SURFACING	AC	= ASPHALTIC CONCRETE
AB(3)	= CLASS III AGGREGATE BASE	SRA	= STATE RESPONSIBILITY AREA
OG	= ORIGINAL GROUND	TI	= TRAFFIC INDEX

* Parcels served which do not have public road frontage

** Penetrating oil shall be SC 800 grade

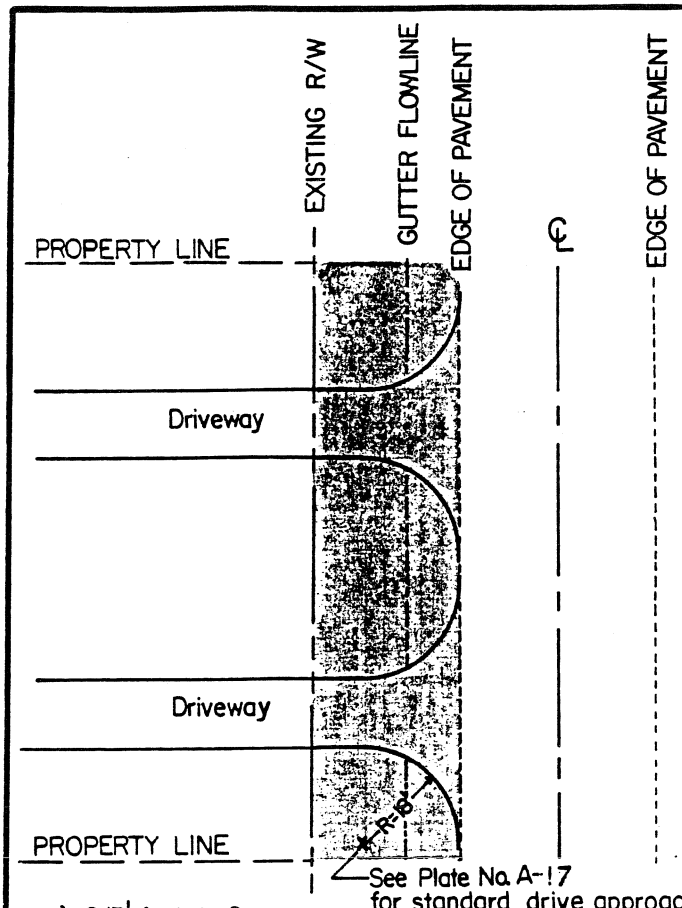
*** In the SRA, surfacing widths and structural section requirements for PVAEs serving three parcels, two parcels, or one parcel with more than two buildings or four or more dwelling units shall be improved to the following standards. Structural section requirements shall consist of AB(3) surfaced with AC or RMAS designed using a TI of 3.0. Pavement width shall be 18 feet, within an easement width of 20 feet. Grades shall not exceed 16 percent.

PRIVATE VEHICULAR ACCESS EASEMENT STANDARDS

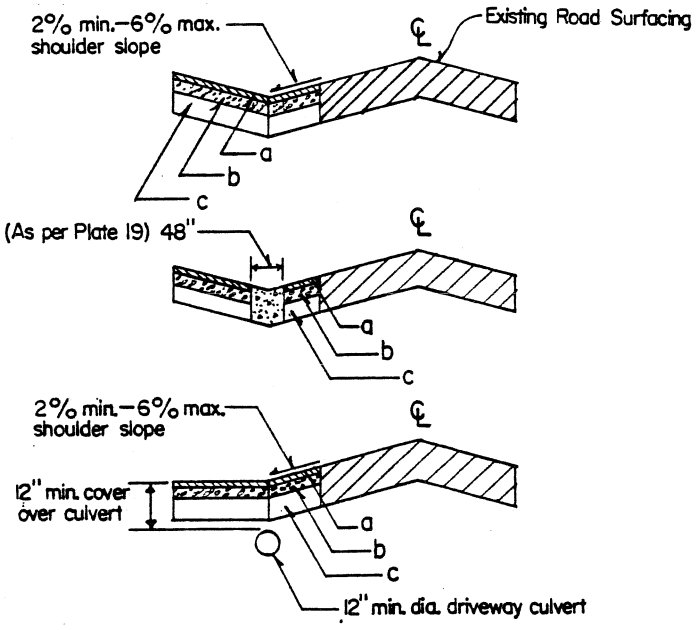
TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

VEHICULAR ACCESS EASEMENTS

PLATE NO. A–17–B



a.) 0.13' Asphalt Concrete
b.) 0.25' Min. Aggregate Base.– 95% Compacted
c.) 0.50' Orginal Ground– 95% Compacted



NOTES:

Roadside drainage to be provided by use of asphalt gutter (0.5 % min. slope), or concrete Vee gutter (0.4% min. slope), or 12" min. dia. culvert

1. The granting of permission to perform frontage paving is not intended to allow driveway approach widths, at the existing R/W line, that exceed the standards. Approach widths and locations shall be defined by means approved by the Road Commissioner.
2. The diameter and length of driveway culvert shall be determined by the Road Commissioner based upon the hydraulic capacity needed and other field conditions. Driveway culverts shall be standard culverts designed to withstand traffic loads and soil conditions.
3. Vee gutter shall be placed at normal curb and gutter location and with a minimum flowline slope of 0.4% as per plate A-19.

REVISED 9-5-89

PUBLIC ROAD STANDARDS

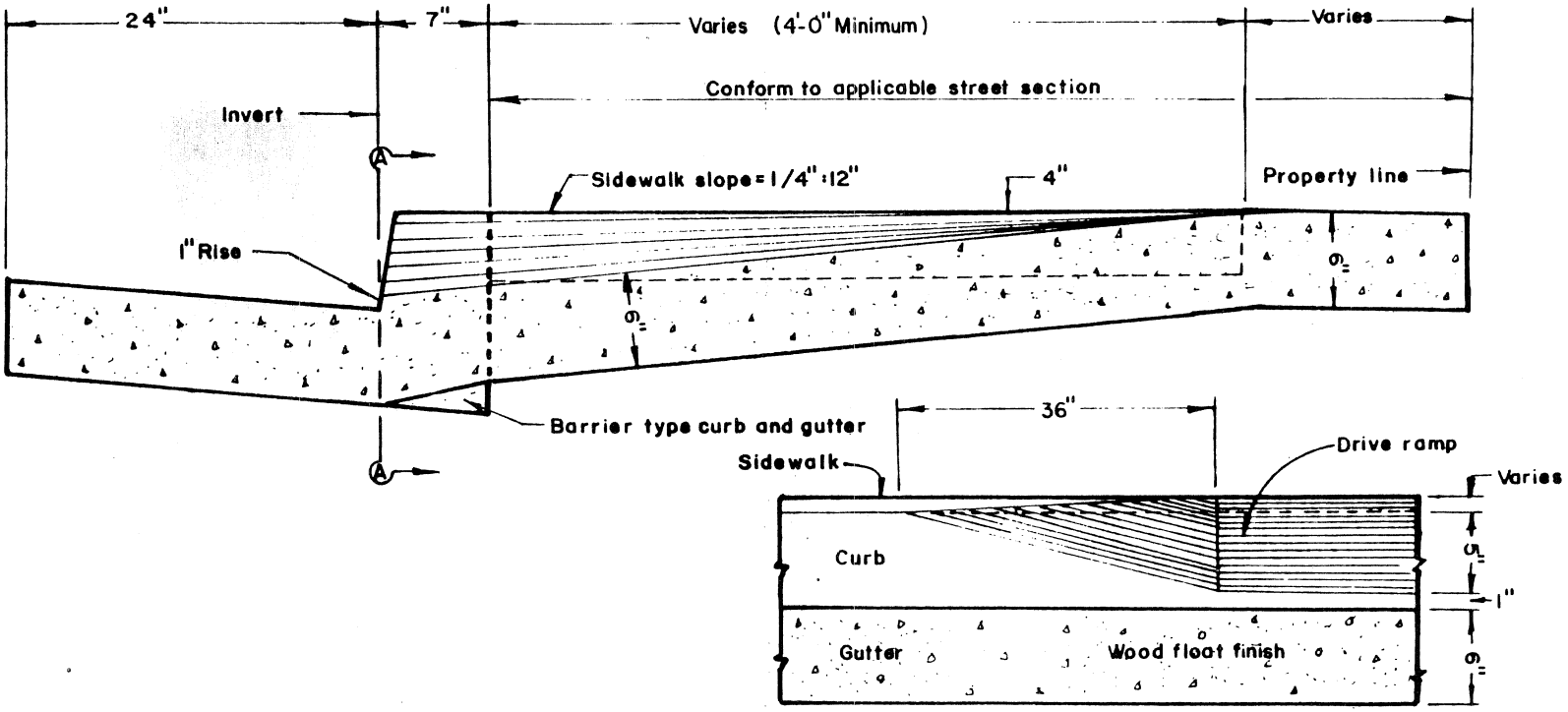
(DOES NOT APPLY INSIDE URBAN IMPROVEMENT AREA BOUNDARY)

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

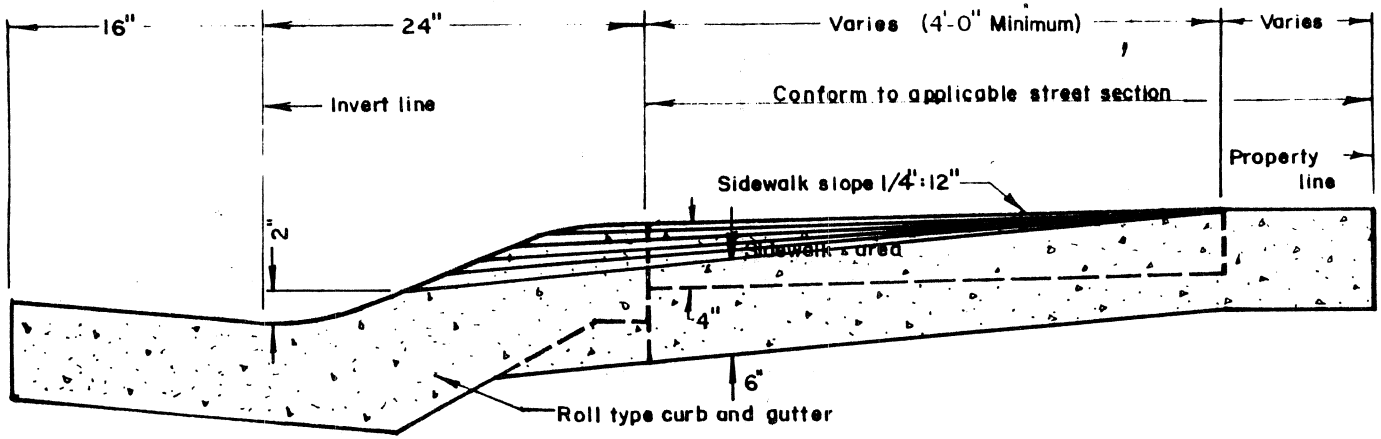
RURAL FRONTAGE PAVING DETAILS

PLATE NO. A-17C

PUBLIC ROAD STANDARDS



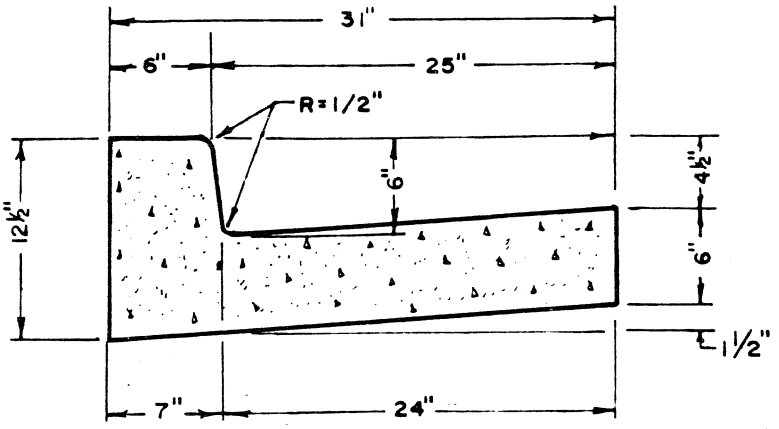
SECTION A-A

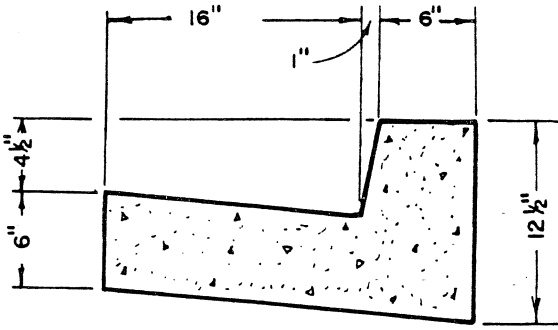


TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

DRIVEWAY
APPROACH

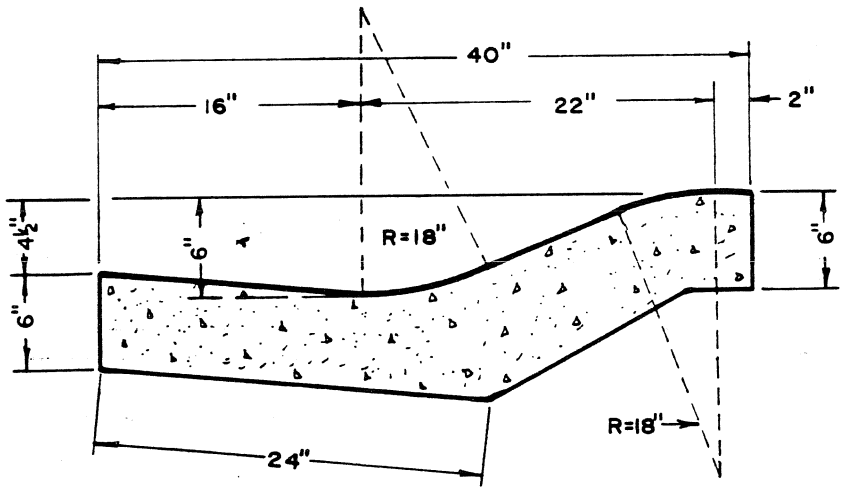
PLATE NO. A-18





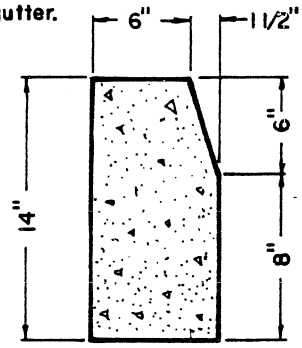
To be used only on returns where Roll-Barrier transition is required.

CURB and GUTTER
BARRIER TYPE

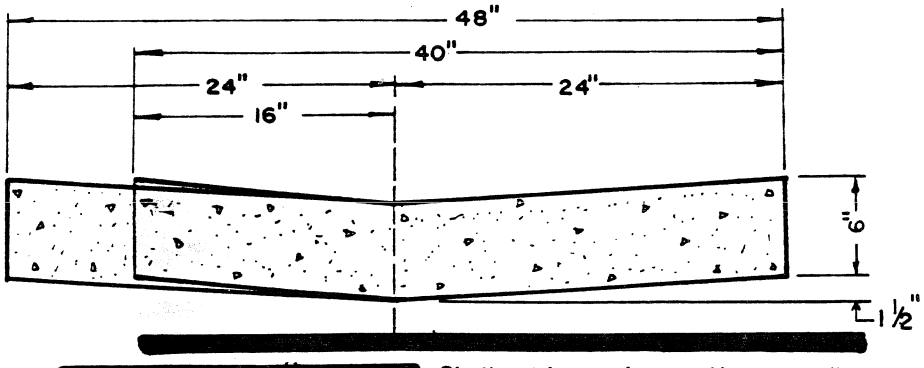


CURB and GUTTER
ROLL TYPE

Notes: Barrier type curb and gutter shall have a minimum gradient of 0.15 feet per 100 feet.
Roll type curb and gutter shall have a minimum gradient of 0.40 feet per 100 feet.
All concrete shall be of class "B" concrete- 5 sack mix
Area between back of curb and and property line shall be back filled and sloped to drain to gutter.



CURB



Shall not be used as continuous gutter at intersection.

Vee gutter shall have a minimum gradient of 0.40 feet per-100feet.

VEE GUTTER

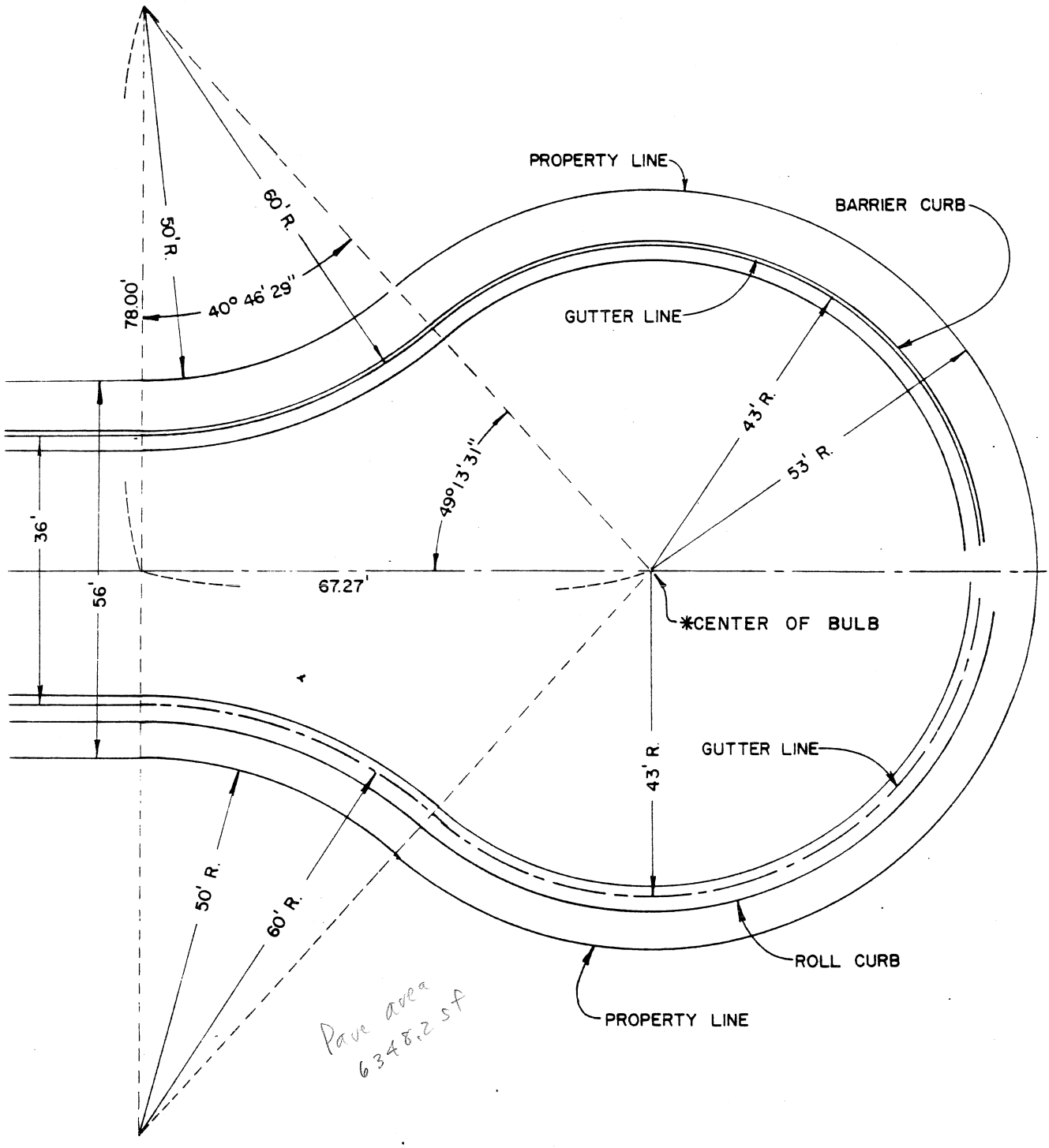
REVISED 9-5-89

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

CURB and GUTTER

PLATE NO. A-19



* Elevation of pavement surface at center of bulb shall be designed to allow pavement slope to gutter of 2% minimum.

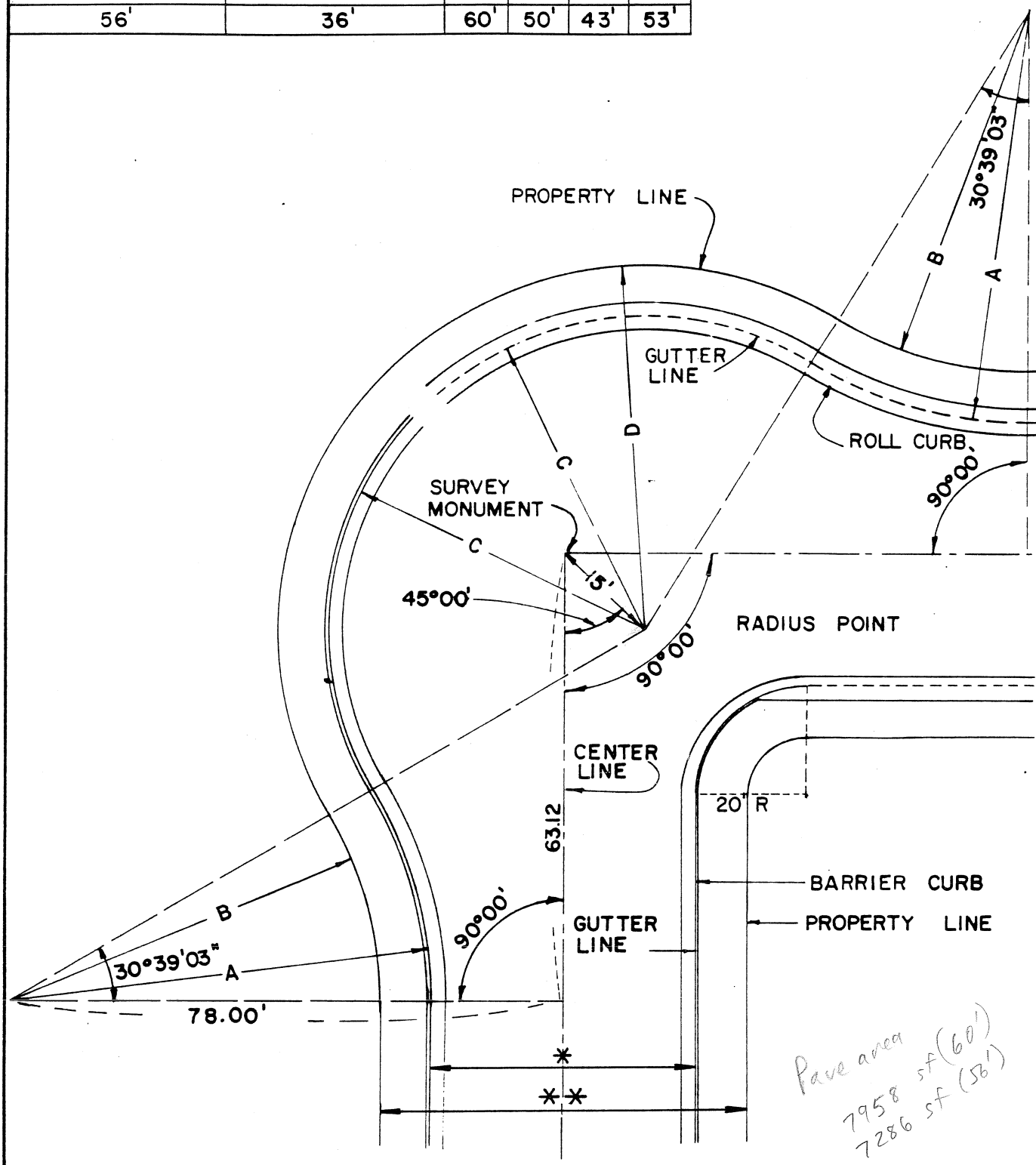
PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

CUL-DE-SAC

PLATE NO. A-20

** WIDTH OF RIGHT OF WAY	* CURB TO CURB ROAD WIDTH	LENGTH OF RADIUS			
		A	B	C	D
60'	40'	58'	48'	45'	55'
56'	36'	60'	50'	43'	53'



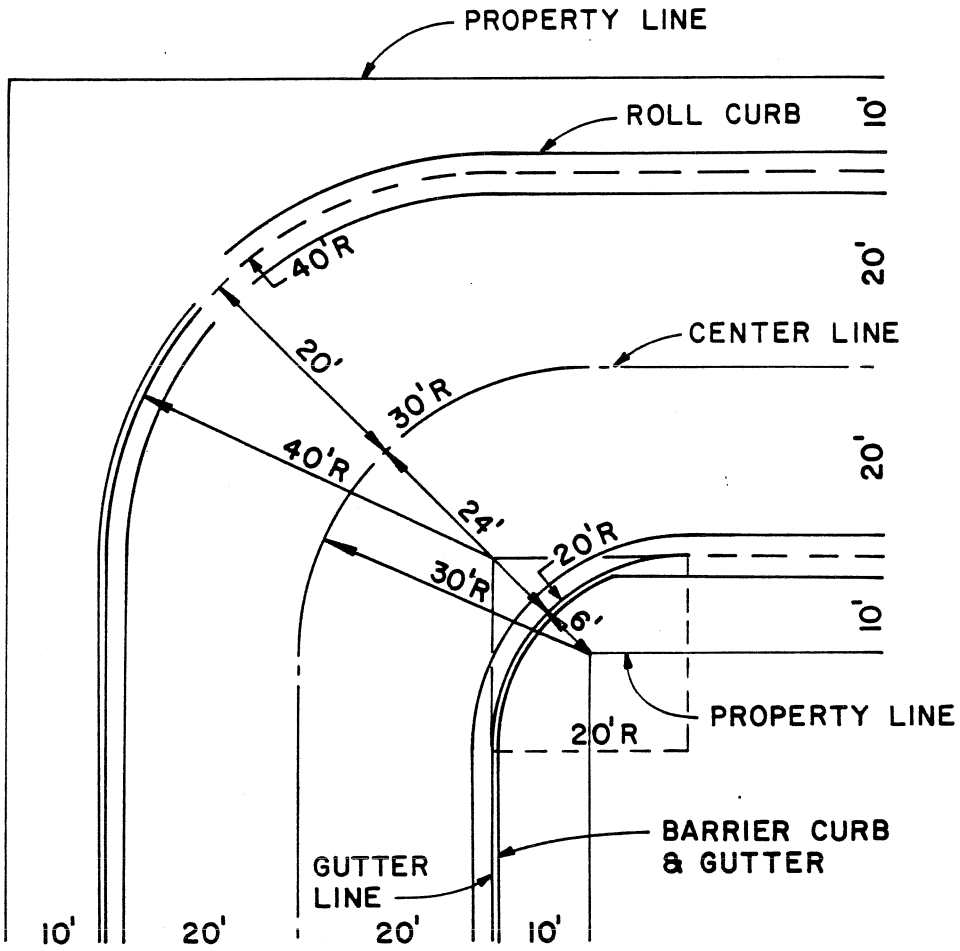
Pave area
7958 sf (60')
7286 sf (56')

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

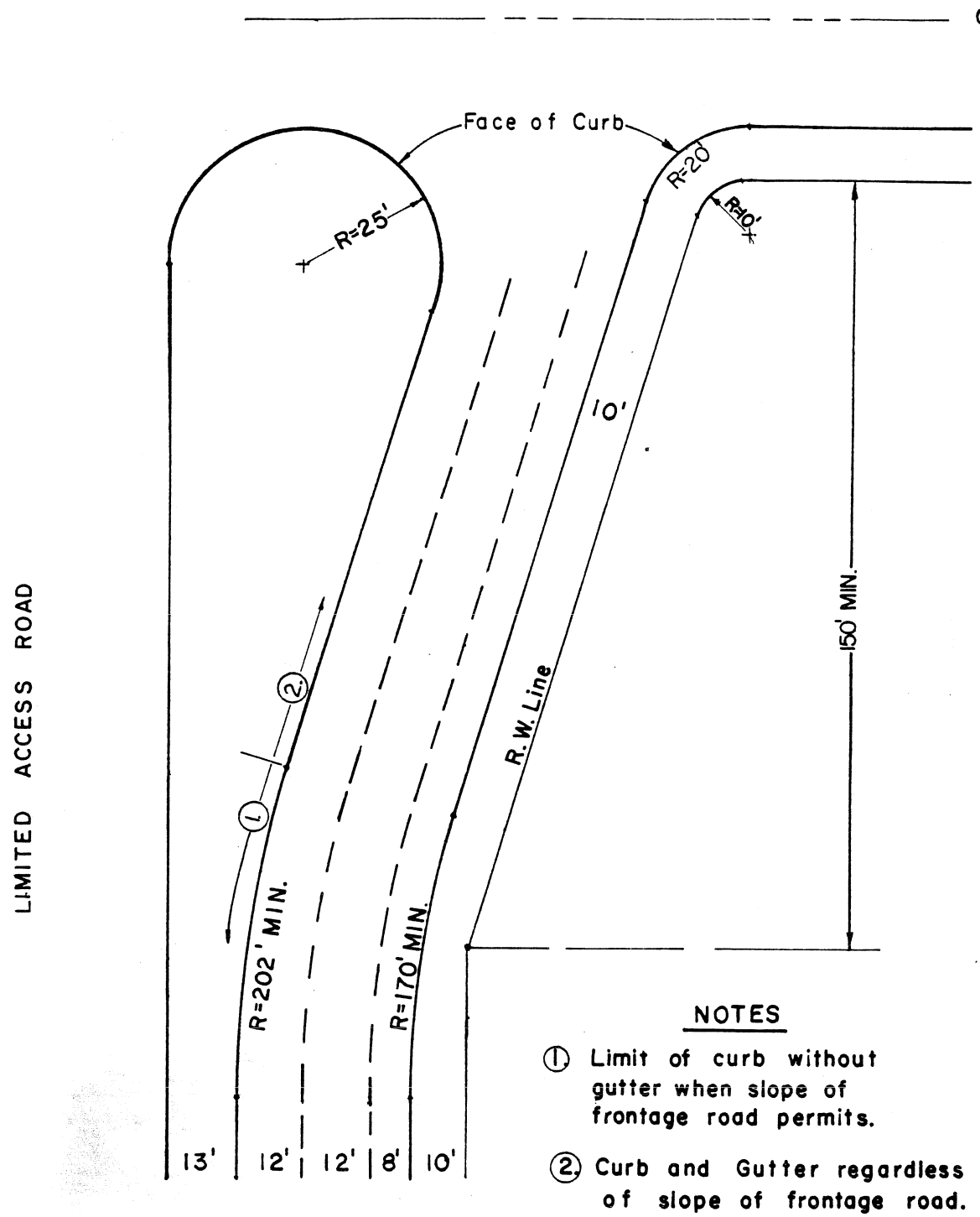
STREET BULB CONNECTION

PLATE NO. A-21



PUBLIC ROAD STANDARDS

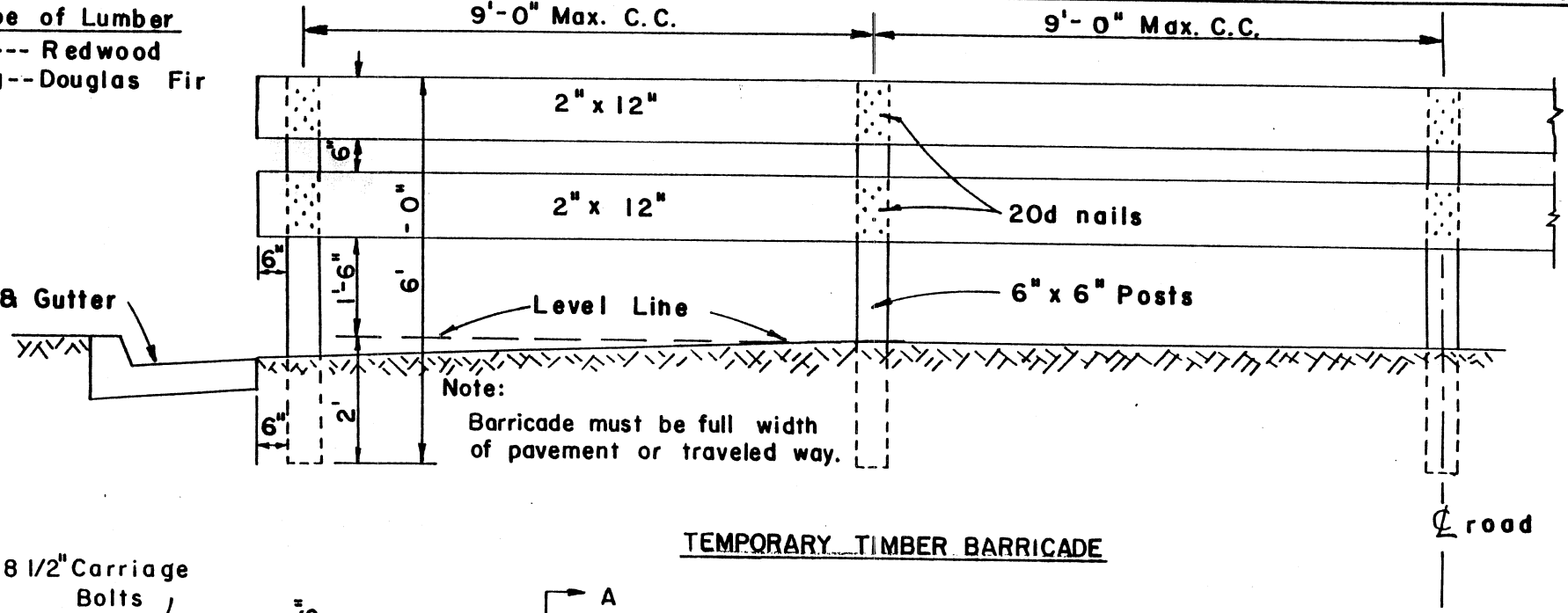
TULARE COUNTY ORDINANCE CODE SECTION NO. 7080
STREET CONNECTION WITHOUT BULB
PLATE NO. A-21-a



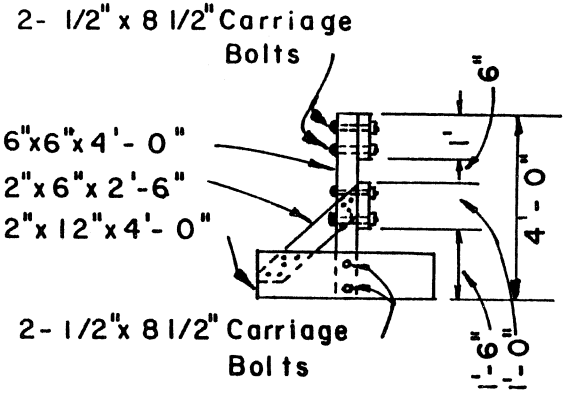
PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080
FRONTAGE ROAD BULB LAYOUT
PLATE NO. A-22

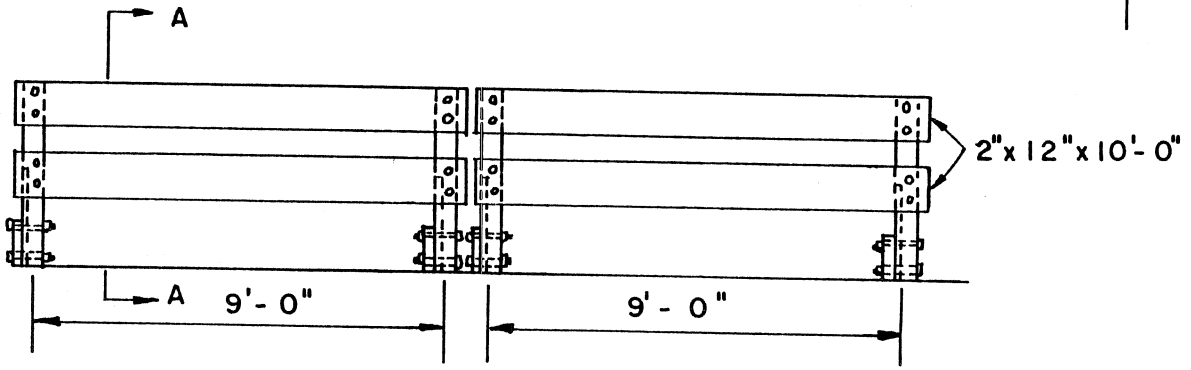
Type of Lumber
Posts ---- Redwood
Railing--Douglas Fir



TEMPORARY TIMBER BARRICADE



SECTION A-A



PORTABLE TIMBER BARRICADE

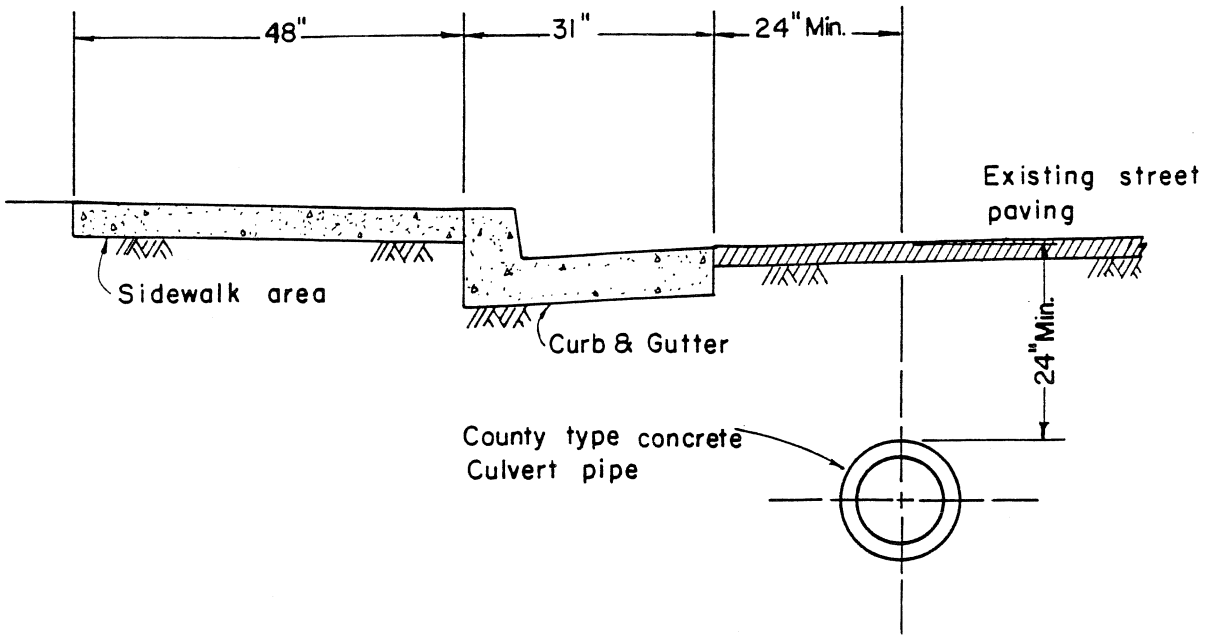
Note:
Appropriate signs to be designated by the Road Commissioner. All signs to be in accordance with the State of California Standards.
Two coats of white paint shall be applied to the surface of all lumber.

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

BARRICADES

PLATE NO. A-23



STRENGTH REQUIREMENTS:

Design and Test Requirements of County type Concrete Culvert pipe are given in the following table:

INSIDE DIAMETER INCHES	MIN. SHELL THICKNESS INCHES	MINIMUM CIRCULAR REINF.(a.)	ULTIMATE LOAD REQUIREMENTS THREE-EDGE BEARING METHOD LB. PER LIN. FT.	D-LOAD
12	2	NONE	3000	3000 N/A
15	2	NONE	2750	2200 N/A
18	2 1/4	NONE	2700	1800 N/A
21	2 1/2	.086	3000 N/A	1700
24	2 5/8	.086	3000 N/A	1500

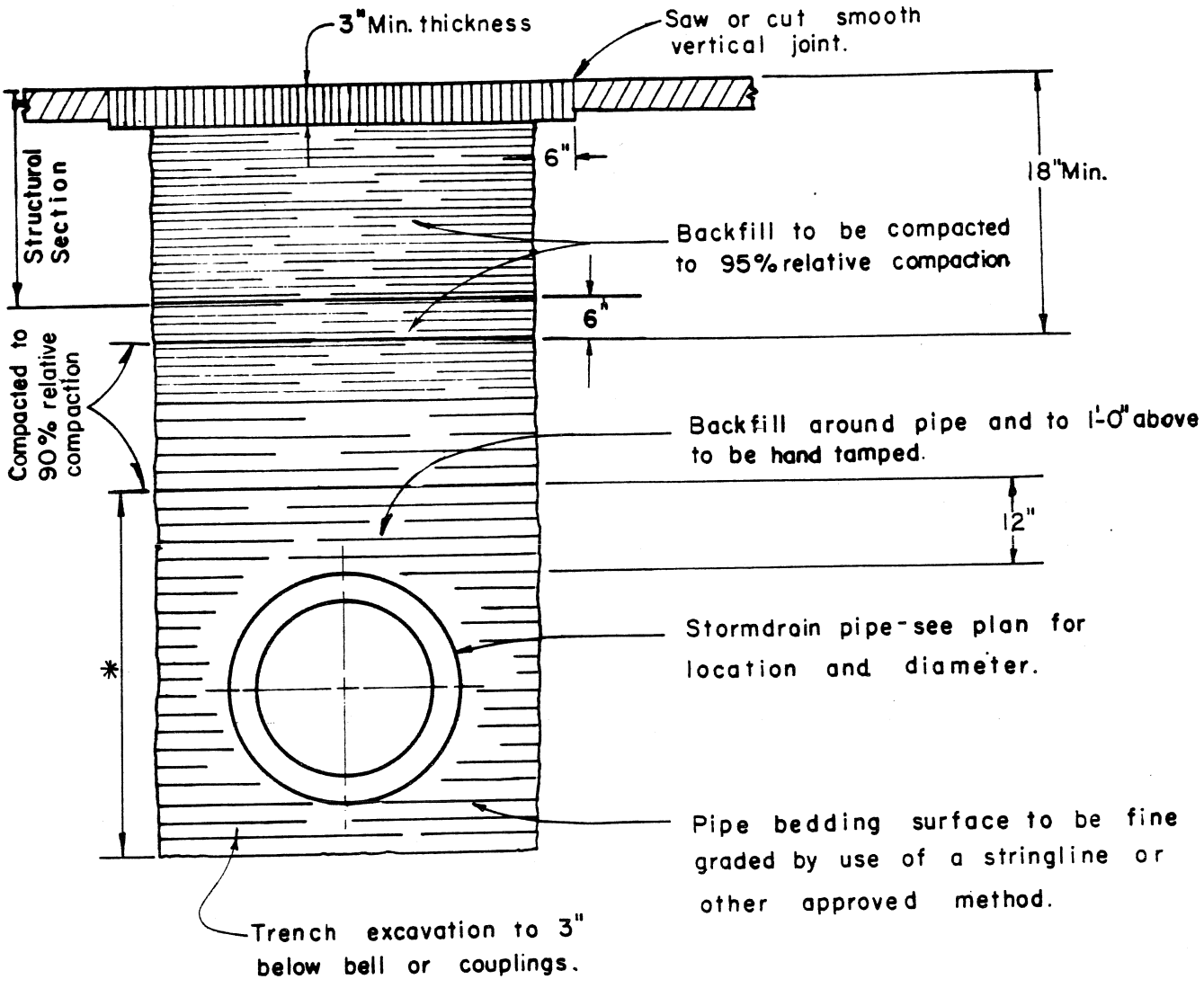
(a) In square inches per linear foot of pipe barrel. One line of reinforcement of the specified area or greater shall be placed in the barrel of the pipe equally distant from its inner and outer surfaces.

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

PIPE LOCATION AND STRENGTH REQUIRMENT

PLATE NO. A-24



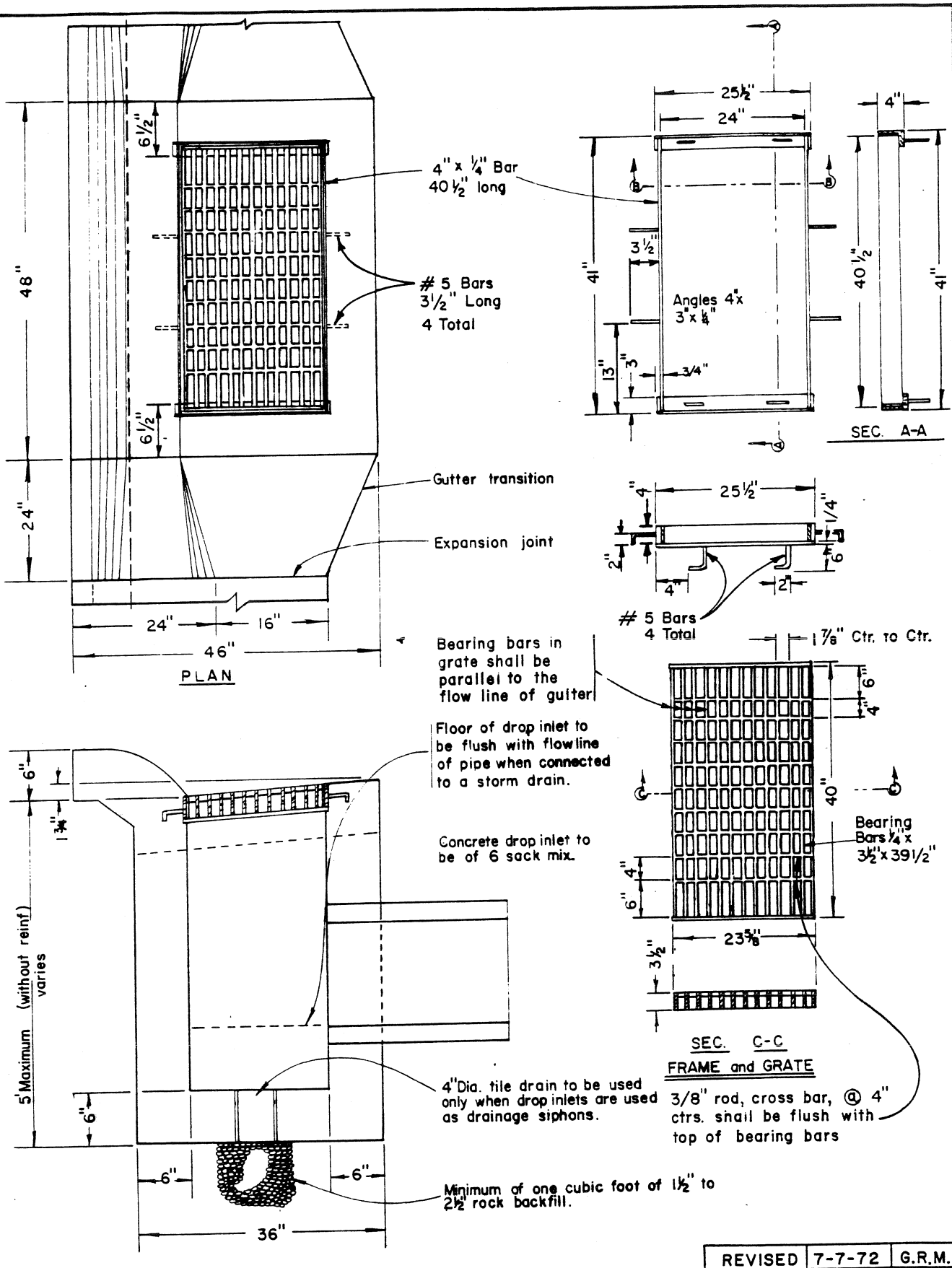
*Backfill around pipe and to 1'-0" above top of pipe may be material from the excavation only if it has a sand equivalent of 30 minimum. For plastic pipe backfill around pipe and to 1'-0" above top of pipe may be material from the excavation only if it is coarse sand or decomposed granite free of rocks larger than 1 1/2" diameter.

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

BACKFILL AND STREET EXCAVATION

PLATE NO. A-25



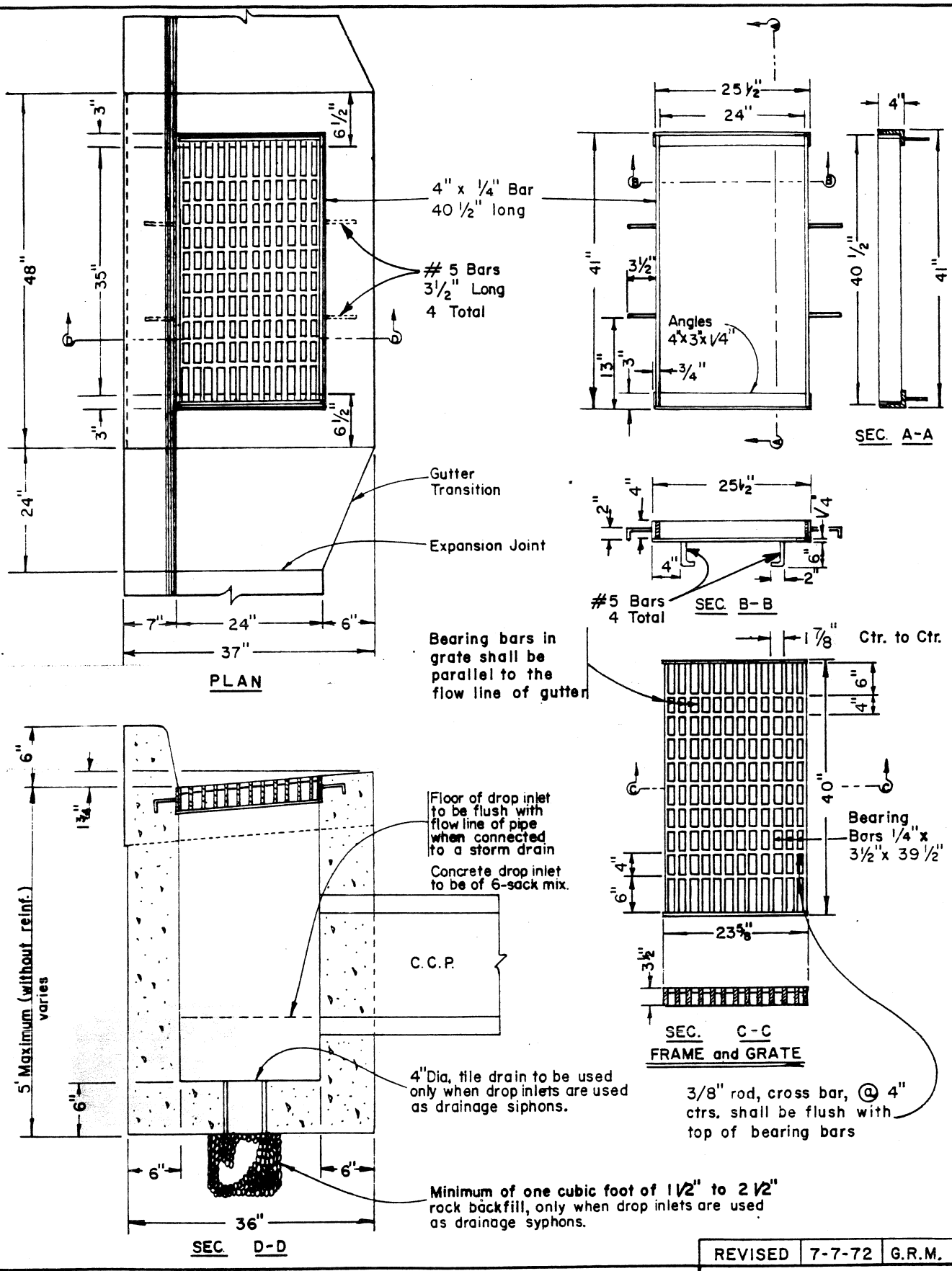
REVISED	7-7-72	G.R.M.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

ROLL CURB
DROP INLET

PLATE NO. A-26



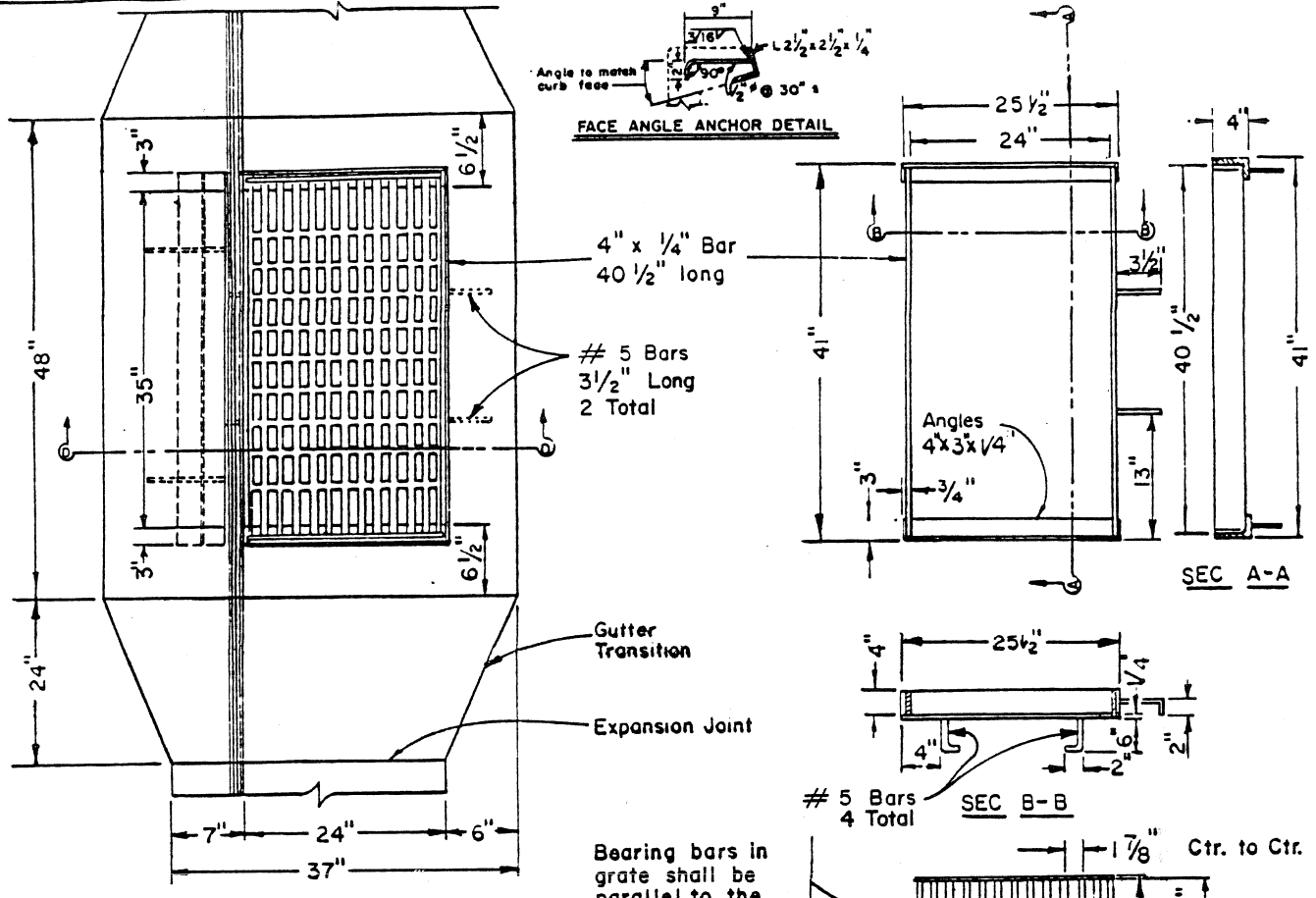
REVISED	7-7-72	G.R.M.

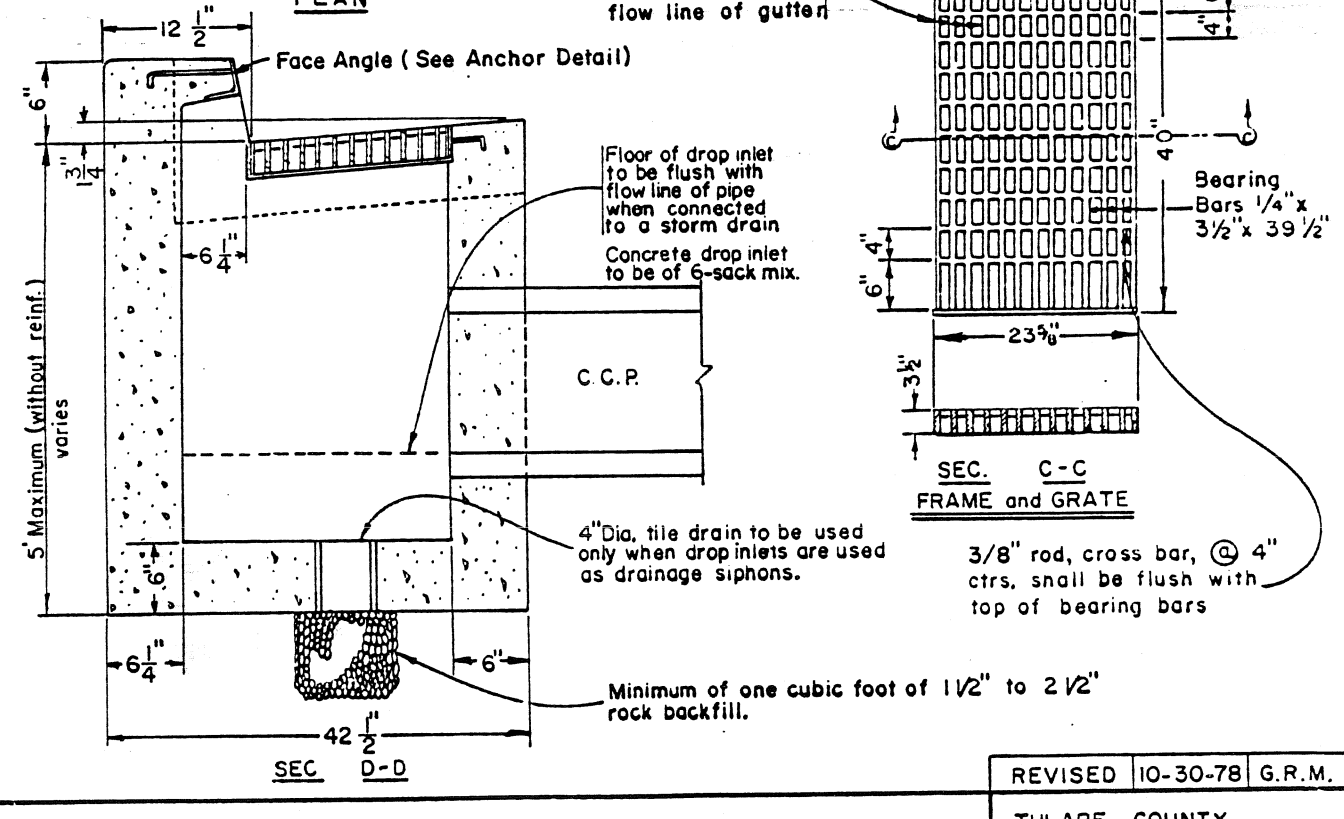
PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

BARRIER CURB
DROP INLET

PLATE NO. A-27





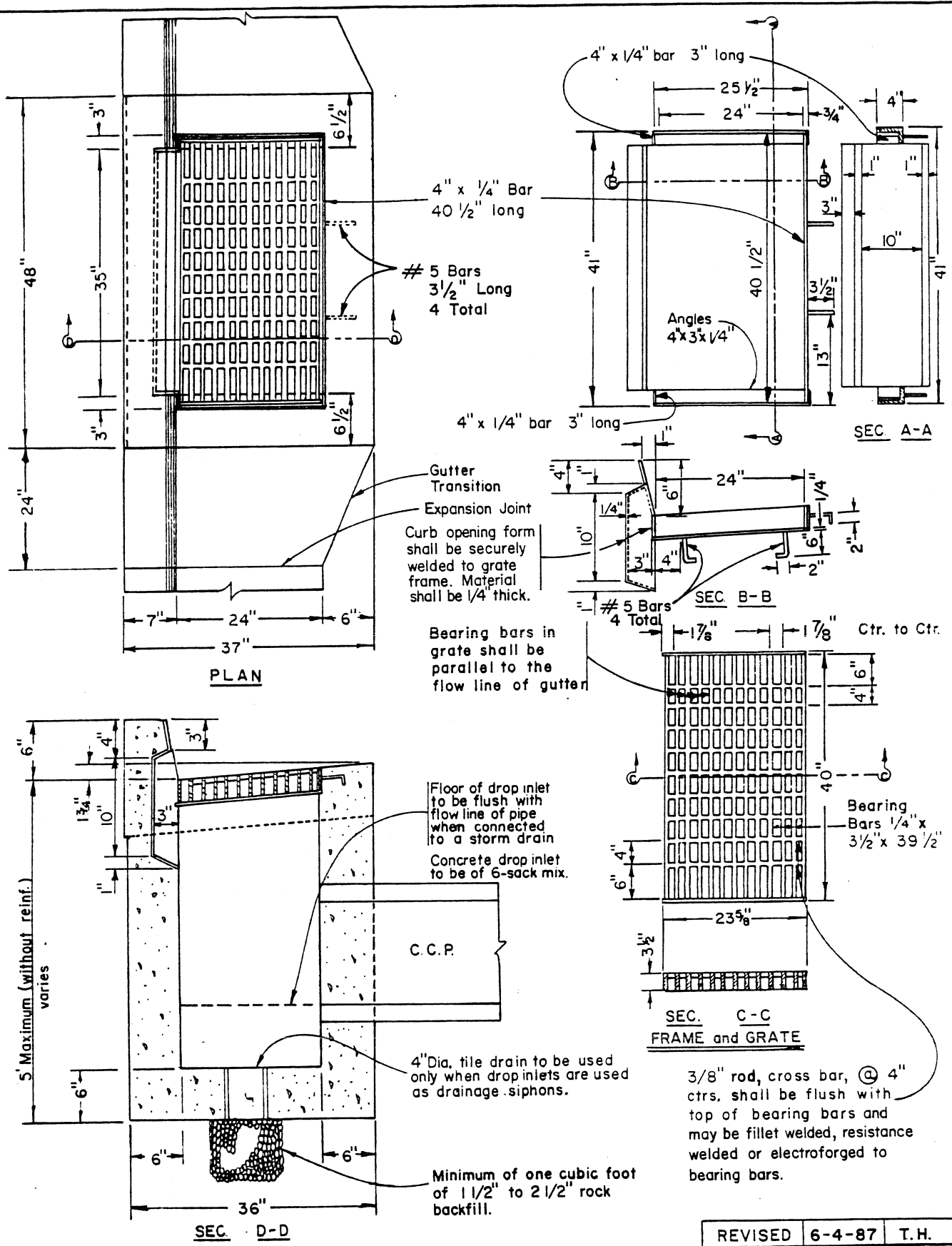
REVISED	10-30-78	G.R.M.

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

PUBLIC ROAD STANDARDS

BARRIER CURB
SIDE OPENING
DROP INLET

PLATE NO. A-27a



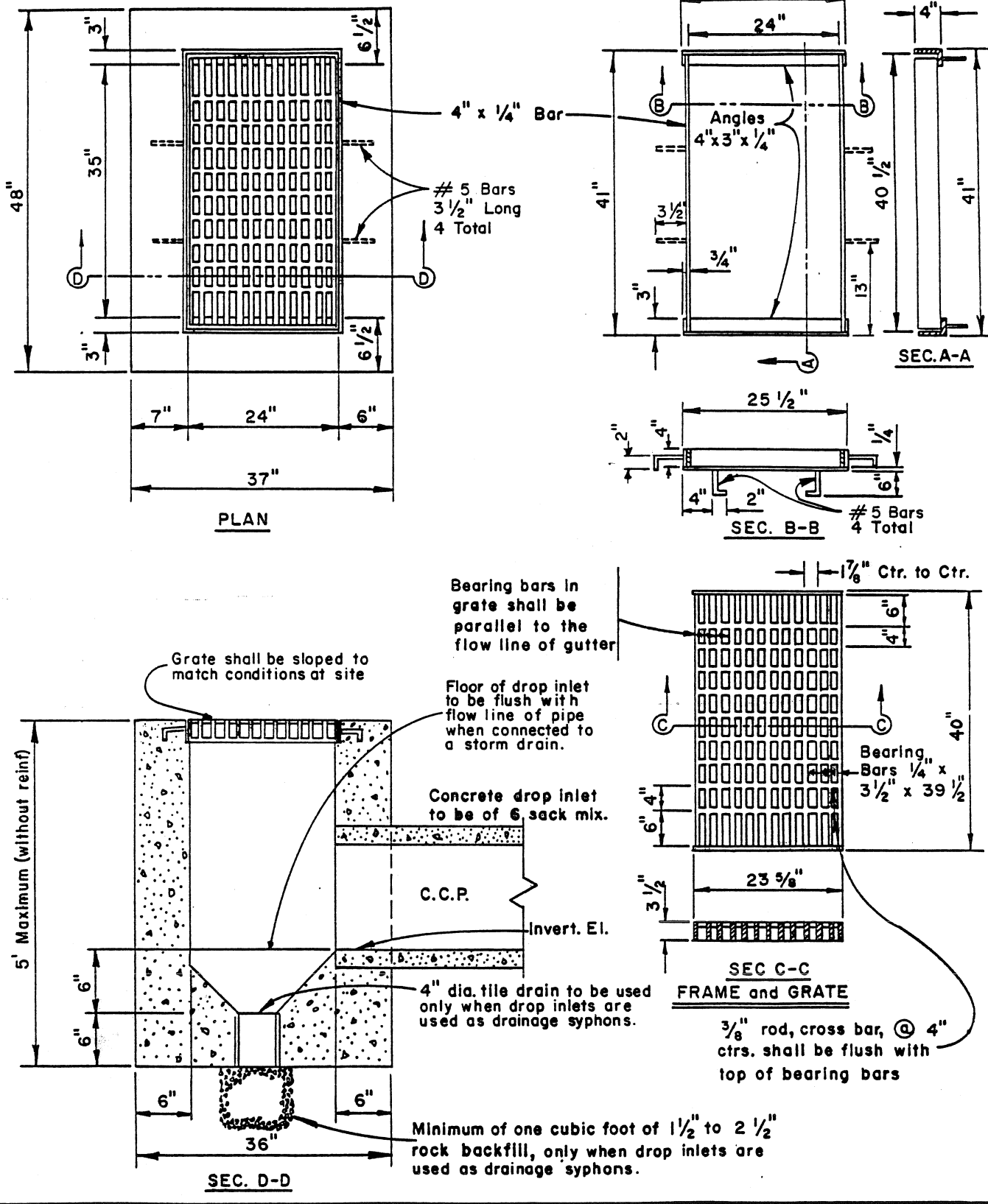
REVISED	6-4-87	T.H.

PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

BARRIER CURB
SIDE OPENING
DROP INLET

PLATE NO. A-27 b



TYPE "A" DROP INLET
PUBLIC ROAD STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

TYPE A DROP INLET
WITHOUT CURB & GUTTER

PLATE NO. A-27c